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INDEX TO

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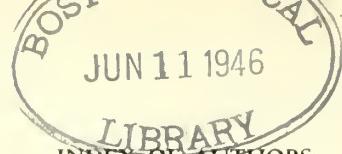
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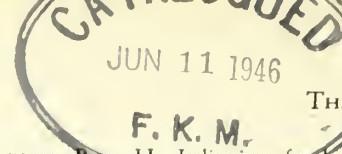
The Official Journal of the
North Dakota State Medical Association
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LIBRARY
INDEX OF AUTHORS

- AAGAARD, G. N., Objective tests of cardiac function, 391
 ABRAMSON, MILTON, Anesthetic aspiration asphyxia as a cause of maternal mortality and morbidity, 19
 ADAMS, FORREST H., Rubella in pregnancy and congenital malformations, 197
 ADAMS, JOHN M., A third epidemic of primary virus pneumonitis among infants in Minnesota, 192
 ALTEMEIER, W. A., Penicillin in surgery, 93
 ANDERSON, GAYLORD W., Global epidemiology, 47
 APPLEWHITE, C. C., Medical leadership in public health, 355
 BARNES, ARLINE R., The consideration of two cardiac cases amenable to surgical treatment, 382
 BAUER, W. W., Health education by the doctor, 106
 BERGE, WENDELL, Justice and the future of medicine, 122
 BOYNTON, RUTH E., Maternal and child health, 63
 ———, Tuberculosis deaths among children, 148
 BROWN, FRANCES M., The physician and the child with defective speech, 200
 BYRD, OLIVER E., American Student Health Association News Letter, 202, 257
 CANFIELD, ALBERT. See PETERSON, W. E., joint author.
 CANUTESON, RALPH I., College health service, 375
 ———, Health service objectives (presidential address), 419
 CLARK, IVOR, Vision problems of military students with heavy academic loads, 23
 CLAYMAN, S. G., An unusual case of primary carcinoma of the liver associated with diabetes mellitus, pulmonary tuberculosis and tuberculosis empyema, 144
 COHEN, JOSEPH T., Dental arch development as a guide to time for malocclusion, 176
 COHEN, SUMNER S., Tuberculosis of the cervical lymph nodes, 151
 COUNSELLER, VIRGIL S., and SLUDER, FLETCHER S., Hysterectomy: selection of the appropriate operation in the particular case, 26
 CRUMP, E. PERRY, Convulsions in infants and children, 182
 CUMMING, HARRY A., The management of acne vulgaris, 254
 DIAMOND, JACK L., Rupture of heart: review and case report, 396
 DIEHL, HAROLD S., Seventy-five years of medical journalism in the Northwest, 82
 DWAN, PAUL F., The management of rheumatic fever, 199
 DREW, HARRY O., Thyrotoxicosis, 351
 EDSELL, GEOFFREY, The control of disease by means of immunization, 50
 EMERSON, HAVEN, Community health organization, 78
 EWALD, PAUL P., Digitalis: its legitimate field of usefulness, 398
 ———, Pregnancy and diabetes, 13
 FINDLEY, THOMAS, Obligations of an internist to a general surgeon, 429
 FINK, DANIEL L., The detection of pulmonary tuberculosis on induction into military service, 5
 FOKER, L. W., Changing attitudes toward industrial hygiene, 76
 FORSYTHE, WARREN. See MURPHY, MELBOURNE, joint author.
 GOEHL, R. O., Management of the common cardiac irregularities, 391
 GREGG, HAROLD W., Factors in prognosis in coronary disease, 385
 HACKER, GUY L., A survey of tuberculosis observed at Freedman Clinic 1934-1944, and related statistics, 140
 HANSEN, ARILD E., Some problems in fat metabolism in children, 167
 HANSEN, ERLING W., Ophthalmology, 248
 HARRINGTON, T. L., The tuberculin test and health education, 139
 HILLEBOE, HERMAN E., and NEWITT, ARTHUR W., Small film radiography in industrial groups, 133
 HOFFBAUER, F. W., Needle biopsy of the liver, 246
 HOFFMAN, WALTER LEES, Ophthalmic migraine, 252



THE JOURNAL-LANCET

F. K. M.

- HOLINGER, PAUL H., Indications for bronchoscopy in pulmonary disease, 233
 HOLMES, JOSEPH A., Observations on tropical disease, 272
 HOWARD, ELNA M., Erythroblastosis fetalis, 1
 JENSEN, REYNOLD A., and WERT, ALVIN D., Conversion hysteria in children, 172
 JORDAN, LEWIS S., Continuation of the Mantoux program in rural Minnesota, 142
 KAMMAN, GORDON R., Fatigue as a symptom in depressed patients, 238
 KEY, J. ALBERT, The problem of deformity in poliomyelitis, 358
 LANNIN, BERNARD G. See LEVEN, N. LOGAN, joint author.
 LAWSON, CHESTER W., Malaria: medical observations in South China and notes on the health situation in an internment camp under the Japanese, 241
 LAYMON, CARL W., Allergy in dermatology, 251
 LEIGH, R. E., Symposium on obstetrics, introduction, 211
 LEVEN, N. LOGAN, and LANNIN, BERNARD G., Congenital atresia and congenital tracheoesophageal fistula, 179
 LIEBELER, W. A., Diagnosis and treatment of ectopic pregnancy, 218
 LOWRY, ELIZABETH C., Chickenpox encephalitis, 191
 LYNCH, FRANCIS W., Ringworm of the scalp (*Tinea capitis*), 228
 McDougall, BERNARD, X-ray discovered 50 years ago, 422
 MCPHEE, H. R., Spurious fitness by the endurance test, 226
 MAXEINER, STANLEY R., Resection of pancreas for hyperinsulinism due to islet-cell tumors, 256
 MEYER, W. I., Diagnosis and postsanatorium care in pulmonary tuberculosis, 426
 MOORE, O. M., Roseola infantum, 243
 MORLOCK, CARL G., Indications for the surgical treatment of peptic ulcer, 8
 MURPHY, MELBOURNE, and FORSYTHE, WARREN, College health service to civilians and military students, 421
 MYERS, J. ARTHUR, The conquest of tuberculosis, 55
 NADLER, SAMUEL B. See PLATOU, R. V., joint author.
 NEWITT, ARTHUR W. See HILLEBOE, HERMAN E., joint author.
 OCKERLY, ORVILLE. See O'LEARY, PAUL A., joint author.
 O'LEARY, PAUL A., and OCKERLY, ORVILLE E., Syphilis of the lung, 154
 PARRAN, THOMAS, Foreword to 75th anniversary issue, 37
 PETERSON, W. E., and CANFIELD, ALBERT, Miliary tuberculosis vs. typhoid fever, 138
 PILPEL, HARRIET F. See STONE, ABRAHAM, joint author.
 PLATOU, R. V., and NADLER, SAMUEL B., Jaundice in infancy and childhood, 186
 POHL, JOHN F., Glomus tumor, 253
 ———, The Kenny concept and treatment of infantile paralysis, 265
 QUISLING, SVERRE, Treatment of deafness, ear-noises and dizziness by hypothermic therapy, 219
 RANSOM, E. M., Placenta praevia, 212
 RICHARDS, W. E., Body minerals, 316
 DE ROETTH, ANDREW, Hypofunction of the lacrimal gland and the Sjögren syndrome, 423
 ROSENOW, EDWARD C., Specific types of Alpha streptococci and streptococcal precipitinogen in air, 108
 SEMSCH, ROBERT D., and STOESSER, ALBERT V., Intratibial infusions in children, 194
 SHAPIRO, M. J., Treatment of rheumatic fever, 400
 SIGEL, HARRY, Dermatological problems in a college with A.S.T.P. students, 15
 SIMMONS, JAMES STEVENS, Recent advances in the control of insect-borne diseases, 38
 SINAI, NATHAN, Organization for medical care, 69
 SLUDER, FLETCHER S. See COUNSELLER, VIRGIL S., joint author.

- SMILEY, DEAN F., Health education, 71
 STARE, FREDRICK J., The improvement of health through better nutrition, 65
 STARK, LEONARD J., Low back pain in the Army Specialized Training Program, 223
 STIEGLITZ, EDWARD J., Preventive geriatric medicine, 60
 STOESSER, ALBERT V. See SEMSCH, ROBERT D., joint author.
 STONE, ABRAHAM, and PILPEL, HARRIET F., The present-day status of contraception, 101
 SUBY, HOWARD I., Prevention of crystallization and stone formation during urinary drainage, 428
 URENN, B., Abrupto placenta, 215
 WALTERS, RAYMOND, Higher education in the postwar era, 17
 WATSON, CECIL J., On the founding of a Variety Club Heart Hospital, 402
 WERT, ALVIN D. See JENSEN, REYNOLD A., joint author.
 WHITE, S. MARX, Introductory statement, special heart issue, 381
 WHITTAKER, HAROLD A., Achievements in environmental sanitation, 43
 WICKS, F. L., Presidential address, North Dakota State Medical Association, 305
 WILSON, JAMES L., Poliomyelitis (editorial), 405
 WITTICH, F. W., Use of the passive transfer or indirect method of skin testing in allergic diseases, 249
 WOLF, THETA H., The reading disability: a pediatric problem, 184
 WYLER, CARL I., Neurotic problems in a student practice, 104

INDEX OF ARTICLES

- Abrupto placenta, B. URENN, 215
 Achievements in environmental sanitation, HAROLD A. WHITTAKER, 43
 Acne vulgaris, management of, HARRY A. CUMMING, 254
 Alcoholic thirst, 231
 Allergy:
 Allergy in dermatology, CARL W. LAYMAN, 251
 Use of the passive transfer or indirect method of skin testing in allergic diseases, F. W. WITTICH, 249
 American Student Health Association:
 Editorial by president, 375
 Fourteenth Annual Report of Tuberculosis Committee, 322
 News-Letter and Digest of Medical News, 130, 158, 202, 231, 257
 Proceedings, Council Meeting, 415
 Anesthetic aspiration asphyxia as a cause of maternal mortality and morbidity, MILTON ABRAMSON, 19
 Anxiety neurosis (editorial), 260
 Atresia: Congenital atresia and congenital tracheoesophageal fistula, N. LOGAN LEVEN and BERNARD G. LANNIN, 179
 Birthmarks, The inheritance of, 203
 Body minerals, W. G. RICHARDS, 316
 Bronchoscopy, Indications for in pulmonary disease, PAUL H. HOLINGER, 235
 Cancer control (editorial), 161
 Chances of spreading scarlet fever in the family, 258
 Changing attitudes toward industrial hygiene, L. W. FOKER, 76
 Cheese and typhoid fever, 159
 Chickenpox encephalitis, ELIZABETH C. LOWRY, 191
 Child health and medical care, federal-state programs for (editorial), 205
 College health service (editorial), 375
 College health service to civilians and military students, MELBOURNE MURPHY and WARREN E. FORSYTHE, 421
 Community health organization, HAVEN EMERSON, 78
 Congenital atresia and congenital tracheoesophageal fistula, N. LOGAN LEVEN and BERNARD G. LANNIN, 179
 Conquest of bovine tuberculosis, The, 159
 Conquest of tuberculosis, The, J. ARTHUR MYERS, 55
 Consideration of two cardiac cases amenable to surgical treatment, The, ARLINE R. BARNES, 382
 Continuation of the Mantoux program in rural Minnesota, LEWIS S. JORDAN, 142

- Contraception, The present-day status of, ABRAHAM STONE and HARRIET F. PILPEL, 101
 Control of disease by means of immunization, The, GEOFFREY EDSALL, 50
 Conversion hysteria in children, REYNOLD A. JENSEN and ALVIN D. WERT, 172
 Convulsions in infants and children, E. PERRY CRUMP, 182
 Deafness, ear-noises, and dizziness, treatment of by hypothermic therapy, SVERRE QUISLING, 219
 Dental arch development as a guide to time for malocclusion correction, JOSEPH T. COHEN, 176
 Depression: Fatigue as a symptom in depressed patients, GORDON R. KAMMAN, 238
 Dermatological problems in a college with A.S.T.P. students, HARRY SIGEL, 15
 Dermatology:
 Acne vulgaris, management of, HARRY A. CUMMING, 254
 Allergy in dermatology, CARL W. LAYMAN, 251
 Dermatological problems in a college with A.S.T.P. students, HARRY SIGEL, 15
 Ringworm of the scalp (*Tinea capitis*), FRANCIS W. LYNCH, 228
 Roseola infantum, O. M. MOORE, 243
 Detection of pulmonary tuberculosis on induction into military service, The, DANIEL L. FINK, 5
 Diabetes, Pregnancy and, PAUL P. EWALD, 13
 Diagnosis and postsanatorium care in pulmonary tuberculosis, W. L. MEYER, 426
 Diagnosis and treatment of ectopic pregnancy, W. A. LIEBELER, 218
 Digitalis: its legitimate field of usefulness, PAUL P. EWALD, 398
 Disease and morals (editorial), 84
 Disinfection of air by vapors and mists, 202
 Education:
 Health education, DEAN F. SMILEY, 71
 Health education by the doctor, W. W. BAUER, 106
 Higher education in the postwar era, RAYMOND WALTERS, 17
 Tuberculin test and health education, T. L. HARRINGTON, 139
 Encephalitis: Chickenpox encephalitis, ELIZABETH C. LOWRY, 191
 Epidemiology: Global epidemiology, GAYLORD W. ANDERSON, 47
 Erythroblastosis fetalis, ELNA M. HOWARD, 1
 Exercise and convalescence, 231
 Factors in prognosis in coronary disease, HAROLD W. GREGG, 385
 Fat metabolism in children, Some problems in, ARILD E. HANSEN, 167
 Fatigue as a symptom in depressed patients, GORDON R. KAMMAN, 238
 Federation of Catholic physicians' guilds, 230
 Food value of oleomargarine, 202
 Foreword (to 75th anniversary issue), THOMAS PARRAN, 37
 Geriatrics, a new bimonthly journal, 412
 Geriatrics: Preventive geriatric medicine, EDWARD J. STIEGLITZ, 60
 Global epidemiology, GAYLORD W. ANDERSON, 47
 Glomus tumor (glomangioma, angoneuromyoma, glomal tumor), JOHN F. POHL, 253
 Health education, DEAN F. SMILEY, 71
 Health education by the doctor, W. W. BAUER, 106
 Health service objectives, RALPH I. CANUTESON, 419
 Heart:
 Consideration of two cardiac cases amenable to surgical treatment, ARLINE R. BARNES, 382
 Digitalis: its legitimate field of usefulness, PAUL P. EWALD, 398
 Factors in prognosis in coronary disease, HAROLD W. GREGG, 385
 Heart disease: abstracts, 401

Heart—(Continued)

- Introductory statement, special heart issue, S. MARX WHITE, 381
 Management of the common cardiac irregularities, R. O. GOEHL, 391
 Objective tests of cardiac function, G. N. AGAARD, 391
 On the founding of a Variety Club Heart Hospital, CECIL J. WATSON, 402
 Rupture of heart, JACK L. DIAMOND, 396

- Higher education in the postwar era, RAYMOND WALTERS, 17
 Home nursing helps (editorial), 232
 Hospitals, Postwar planning for (editorial), 233
 Hypofunction of the lacrimal gland and the Sjögren syndrome, ANDREW DE ROETTI, 423
 Hysterectomy: selection of the appropriate operation in the particular case, VIRGIL S. COUNSELLER and FLETCHER S. SLUDER, 26

- Immunization: Control of disease by means of immunization, GEOFFREY EDSALL, 50
 Improvement of health through better nutrition, The, FREDRICK J. STARE, 65
 Indications for bronchoscopy in pulmonary disease, PAUL H. HOLINGER, 235
 Indications for the surgical treatment of peptic ulcer, CARL G. MORLOCK, 8
 Industrial Hygiene:

- Changing attitudes toward industrial hygiene, 76
 Small film radiography in industrial groups, HERMAN E. HILLEBOE and ARTHUR W. NEWITT, 133
 Inheritance of Birthmarks, The, 203
 In Memoriam:
- ERNEST L. MELAND, 34
 - MABEL SIMIS ULRICH, 350, 375
- Insect-borne diseases, Recent advances in the control of, JAMES STEVENS SIMMONS, 38
 Intratibial infusions in children, ROBERT D. SEMSCH and ALBERT V. STOESSER, 194
 Introductory statement, special heart issue, S. MARX WHITE, 381

- Jaundice in infancy and childhood, R. V. PLATOU and SAMUEL B. NADLER, 186
 Justice and the future of medicine, WENDELL BERGE, 122
 Kenny Concept and treatment of infantile paralysis, The, JOHN F. POHL, 265

- List of physicians licensed by the Minnesota State Board of Medical Examiners: November 10, 1944, 86; February 16, 1945, 201; May 19, 1945, 314
 Liver, Needle biopsy of, F. W. HOFFBAUER, 246
 Low back pain in the Army Specialized Training Program, LEONARD J. STARK, 223

- Malaria: Medical observations in South China and notes on the health situation in an internment camp under the Japanese, CHESTER W. LAWSON, 241
 Management of acne vulgaris, The, HARRY A. CUMMING, 254
 Management of the common cardiac irregularities, R. O. Goehl, 391
 Management of rheumatic fever, The, PAUL F. DWAN, 199
 Maternal and child health, RUTH E. BOYNTON, 63
 Mayo memorial, The, 84, 128, 258
 Medical art show (editorial), 375
 Medical care, Organization for, NATHAN SINAI, 69
 Medical correlator, The (editorial), 374
 Medical leadership in public health, C. C. APPLEWHITE, 355
 Meet our contributors, 162, 206, 233, 259, 311, 321, 359, 403, 433
 MELAND, ERNEST L., In memoriam, 34
 Migraine, Ophthalmic, WALTER LEES HOFFMAN, 252
 Miliary tuberculosis vs. typhoid fever, case reports, W. E. PETERSON and ALBERT CANFIELD, 138
 Minneapolis Academy of Medicine, Transactions, 246

- Montana State Medical Association: roster, 369; transactions, 360
 Mumps, A school sponsored epidemic of, 158

- National health program, 256
 Needle biopsy of the liver, F. W. HOFFBAUER, 246
 Neurotic problems in a student practice, CARL I. WYLER, 104
 North Dakota State Medical Association: House of Delegates, transactions, 276; roster, 301

- Objective tests of cardiac function, G. N. AGAARD, 391
 Obligations of an internist to a general surgeon, THOMAS FINDLEY, 431
 Observations on tropical disease, JOSEPH A. HOLMES, 272
 Obstetrics and Gynecology:
- Abrupto placenta, B. URENN, 215
 - Anesthetic aspiration asphyxia as a cause of maternal mortality and morbidity, MILTON ABRAMSON, 19
 - Diagnosis and treatment of ectopic pregnancy, W. A. LIEBELER, 218
 - Placenta praevia, E. M. RANSOM, 212
 - Pregnancy and diabetes, PAUL P. EWALD, 13
 - Rubella in pregnancy and congenital malformations, FORREST H. ADAMS, 197
 - Symposium on obstetrics, introduction, R. E. LEIGH, 211
 - Oleomargarine: Food value of, 202; Some facts about margarine (editorial), 126
 - On the founding of a Variety Club Heart Hospital, CECIL J. WATSON, 402
 - Ophthalmic migraine, WALTER LEES HOFFMAN, 252
 - Ophthalmology, ERLING W. HANSEN, 248
 - Organization for medical care, NATHAN SINAI, 69
 - Oswiecim death camp, statement of committee on medical aspects, 326

- Pancreas, Resection of, for hyperinsulinism due to islet-cell tumors, STANLEY R. MAXEINER, 256
 Pediatrics:
- Conversion hysteria in children, REYNOLD A. JENSEN and ALVIN D. WERT, 172
 - Convulsions in infants and children, E. PERRY CRUMP, 182
 - Dental arch development as a guide to time for malocclusion correction, JOSEPH T. COHEN, 176
 - Erythroblastosis fetalis, ELNA M. HOWARD, 1
 - Intratibial infusions in children, ROBERT D. SEMSCH and ALBERT V. STOESSER, 194
 - Jaundice in infancy and childhood, R. V. PLATOU and SAMUEL B. NADLER, 186
 - Management of rheumatic fever, The, PAUL F. DWAN, 199
 - Physician and the child with defective speech, The, FRANCES M. BROWN, 200
 - Primary virus pneumonitis among infants in Minnesota, A third epidemic of, JOHN M. ADAMS, 192
 - Reading disability: a pediatric problem, THETA H. WOLF, 184
 - Some problems in fat metabolism in children, ARILD E. HANSEN, 167
 - Tuberculosis deaths among children, RUTH E. BOYNTON, 148

- Penicillin in surgery, W. A. ALTEMEIER, 93
 Peptic ulcer, Indications for surgical treatment of, CARL G. MORLOCK, 8
 Physician and the child with defective speech, The, FRANCES M. BROWN, 200
 Placenta praevia, E. M. RANSOM, 212
 Poliomyelitis:
- Editorials, 309, 347, 405
 - Kenny concept and treatment of poliomyelitis, JOHN F. POHL, 265
 - Problem of deformity in poliomyelitis, J. ALBERT KEY, 358
 - Report on poliomyelitis studies made at Minneapolis General Hospital, 30
 - Sister Kenny—five years after, 309
- Pregnancy and diabetes, PAUL P. EWALD, 13
 Present-day status of contraception, The, ABRAHAM STONE and HARRIET F. PILPEL, 101

- Prevention of crystallization and stone formation during constant urinary drainage, HOWARD I. SUBY, 428
 Preventive geriatric medicine, EDWARD J. STIEGLITZ, 60
 Problem of deformity in poliomyelitis, The, J. ALBERT KEY, 358
 Public Health:
 Community health organization, HAVEN EMERSON, 78
 Medical leadership in public health, C. C. APPLEWHITE, 355
 National health program, 256
- Radiography, Small film, in industrial groups, HERMAN E. HILLEBOE and ARTHUR W. NEWITT, 133
 Reading disability, The: a pediatric problem, THETA H. WOLF, 184
 Recent advances in the control of insect-borne diseases, JAMES STEVENS SIMMONS, 38
 Report on poliomyelitis studies made at Minneapolis General Hospital, 30
 Resection of pancreas for hyperinsulinism due to islet-cell tumors, STANLEY R. MAXEINER, 256
 Respiratory tract and nervous system, Specific types of alpha streptococci and streptococcal precipitinogen in air in relation to, EDWARD C. ROSENOW, 108
 Rheumatic fever, Management of, PAUL F. DWAN, 199;
 Treatment of, M. J. SHAPIRO, 400
 Ringworm of the scalp (*Tinea capitis*), FRANCIS W. LYNCH, 228
 Roseola infantum, O. M. MOORE, 243
 Rubella in pregnancy and congenital malformations, FORREST H. ADAMS, 197
 Rupture of heart: review and case report, JACK L. DIAMOND, 396
- Sanitation: Achievements in environmental sanitation, HAROLD A. WHITTAKER, 43
 Scarlet fever: Chances of spreading scarlet fever in the family, 258
 School sponsored epidemic of mumps, A, 158
 Seventy-five years of medical journalism in the Northwest, HAROLD S. DIEHL, 82
 Skin Diseases:
 Acne vulgaris, Management of, HARRY A. CUMMING, 254
 Ringworm of the scalp (*Tinea capitis*), FRANCIS W. LYNCH, 228
 Roseola infantum, O. M. MOORE, 243
 Small film radiography in industrial groups, HERMAN E. HILLEBOE and ARTHUR W. NEWITT, 133
 Some problems in fat metabolism in children, ARILD E. HANSEN, 167
 South Dakota State Medical Association: roster, 339; transactions, 330
 Specific types of alpha streptococci and streptococcal precipitinogen in air, in relation to epidemic infections of the respiratory tract and nervous system, EDWARD C. ROSENOW, 108
 Speech, The physician and the child with defective, FRANCES W. BROWN, 200
 Spurious fitness by the endurance test, H. R. MCPHEE, 226
 Students:
 College health service (editorial), 375
 Neurotic problems in a student practice, CARL I. WYLER, 104
 Tuberculosis deaths among children, RUTH E. BOYNTON, 148
 Vision problems of military students with heavy academic loads, IVOR CLARK, 23
 Survey of tuberculosis observed at Freeman Clinic 1934-1944 and related statistics, A, GUY L. HACKER, 140
 Symposium on obstetrics, introduction, R. E. LEIGH, 211
 Syphilis of the lung, PAUL A. O'LEARY and ORVILLE E. OCKERLY, 154
- Third epidemic of primary virus pneumonitis among infants in Minnesota, A, JOHN M. ADAMS, 192
 Thyrotoxicosis, HARRY O. DREW, 351
 Treatment of deafness, ear-noises, and dizziness by hypothermic therapy, SVERRE QUISLING, 219
 Treatment of rheumatic fever, M. J. SHAPIRO, 400
- Tropical disease, Observations on, JOSEPH A. HOLMES, 272
 Tuberculin test and health education, The, T. L. HARRINGTON, 139
 Tuberculosis:
 Conquest of bovine tuberculosis, 159
 Conquest of tuberculosis, J. ARTHUR MYERS, 55
 Continuation of the Mantoux program in rural Minnesota, LEWIS S. JORDAN, 142
 Detection of pulmonary tuberculosis on induction into military service, DANIEL L. FINK, 5
 Dramatic advances on the tuberculosis front (editorial), 160
 Miliary tuberculosis vs. typhoid fever, W. E. PETERSON and ALBERT CANFIELD, 138
 Survey of tuberculosis observed at Freeman Clinic 1934-1944 and related statistics, GUY L. HACKER, 140
 Tuberculin test and health education, T. L. HARRINGTON, 139
 Tuberculosis among college students, 322
 Tuberculosis deaths among children, RUTH E. BOYNTON, 148
 Tuberculosis in the Army, 202
 Tuberculosis of the cervical lymph nodes, SUMNER S. COHEN, 151
 Unusual case of primary carcinoma of the liver associated with diabetes mellitus, pulmonary tuberculosis and tuberculosis empyema, S. G. CLAYMAN, 144
 Vaccination against tuberculosis, 258
 Tuberculosis among college students, 322
 Tuberculosis deaths among children, RUTH E. BOYNTON, 148
 Tuberculosis in the Army, 202
 Tuberculosis of the cervical lymph nodes, SUMNER S. COHEN, 151
 Tumors:
 Glomus tumor, JOHN F. POHL, 253
 Resection of pancreas for hyperinsulinism due to islet-cell tumors, STANLEY R. MAXEINER, 256
 Typhoid Fever:
 Cheese and typhoid fever, 159
 Miliary tuberculosis vs. typhoid fever, W. E. PETERSON and ALBERT CANFIELD, 138
- ULRICH, MABEL SIMIS, In memoriam, 350, 375
 University of Minnesota: Commended for work of 26th General Hospital, 425; Medical School, expanding facilities at, 240
 Unusual case of primary carcinoma of the liver associated with diabetes mellitus, pulmonary tuberculosis, and tuberculosis empyema, S. G. CLAYMAN, 144
 Use of the passive transfer or indirect method of skin testing in allergic diseases, F. W. WITTICH, 249
- Vaccination against tuberculosis, 258
 Veteran placement of Northrop Aircraft, 257
 Vision problems of military students with heavy academic loads, IVOR CLARK, 23
 Wagner-Murray-Dingell bill, Major provisions of the, 311
 X-ray was discovered 50 years ago, BERNARD McDougall, 422

EDITORIALS

- Anxiety neurosis, 260
 Cancer control, 161
 Capital punishment for capitals, 310
 College health service, 375
 Disease and morals, 84
 Doctors return, The, 434
 Dramatic advances on the tuberculosis front, 160
 Etiology of congenital malformations, The, 204
 Federal-state programs for child health and medical care, 205
 Have you anything to say?, 347
 Heart hospital, 404
 Home nursing helps, 232
 Mayo memorial, The, 84
 Medical art show, 375
 Medical "correlator", The, 374
 New Year, The, 32
 Poliomyelitis, 347, 405

EDITORIALS—(Continued)

- Postwar planning for hospitals, 233
 Prevent TB—buy Christmas seals, 432
 Sister Kenny—five years after, 309
 Some facts about margarine, 126
 Taking an inventory, 261
 Uniform universal youth examinations, 125
 University of South Dakota Medical School adopts four-year curriculum, 431
 Vacations now and then, 346
 What are we willing to pay for health?, 432
 Who shall decide when doctors disagree?, 33

BOOK REVIEWS

- Arterial Hypertension, by IRVINE H. PAGE and ARTHUR CURTIS CORCORAN, 203
 Atlas of the Blood in Children, by KENNETH D. BLACKFAN, 157
 Autobiography of Science, The, edited by FOREST RAY MOULTON and JUSTUS J. SCHIFFERES, 261
 Bronchial Asthma, by LEON UNGER, 359
 Clinical Lecture on the Gallbladder and Bile Ducts, by SAMUEL WEISS, 308
 Clinical Roentgenology of the Digestive Tract, by MAURICE FELDMAN, 230
 Control of Pain in Childbirth, by CLIFFORD B. LULL and ROBERT A. HINGSON, 124
 Doctor's Job, The, by CARL BINGER, 157
 Essentials of Body Mechanics in Health and Disease, by GOLDTHWAITE, BROWN, SWAIN, and KUHNS, 308
 Examination of Reflexes, The, by ROBERT WARTENBERG, 432
 Fertility in Men, by ROBERT SHERMAN HOTCHKISS, 406
 Fertility in Women, by SAMUEL L. SIEGLER, 406

- Forsdike's Textbook of Gynecology, by J. H. PEEL, 229
 Fractures and Dislocations, by EDWIN O. GECKELER, 432
 Gastroenterology, Vol. II, The Small and Large Intestines and Peritoneum, by HENRY L. BOEKUS, 33
 Hayfever Plants, by ROGER P. WODEHOUSE, 432
 Malaria in the Upper Mississippi Valley, 1760–1900, by ERWIN H. ACKERNECHT, 259
 Mankind So Far, by WILLIAM HOWELLS, 88
 Marihuana Problem, The, by the Mayor's Committee on Marihuana, 157
 Mass Radiography of the Chest, by HERMAN E. HILLEBOE, 229
 Psychiatric Novels of Oliver Wendell Holmes, by CLARENCE P. OBERNDORF, 157
 Radio in Health Education, Symposium, New York Academy of Medicine, 406
 Radiologic Examination of the Small Intestine, by ROSS GOLDEN, 432
 Rebel Without a Cause, by ROBERT M. LINDNER, 88
 Sternal Puncture, a Method of Clinical and Cytological Investigation, by A. PINNEY and J. L. HAMILTON-PATERSON, 33
 Technical Methods for the Technician, by ANSON LEE BROWN, 432
 Textbook of Gynecology, by EMIL NOVAK, 229
 Treatment of Peptic Ulcer, The, by GEORGE J. HENER, 124
 Urinary Tract, The, A Handbook of Roentgen Diagnosis, by H. DABNEY KERR and CARL L. GILLIES, 33
 Urological Surgery, by AUSTIN I. DODSON, 88
 Yearbook of General Therapeutics, 1944, edited by OSCAR W. BETHEA, 203
 Yellow Magic—the Story of Penicillin, by J. D. RATCLIFF, 230
 You Must Relax, by EDMUND JACOBSON, 203
 Your Eye! Light on Sight, by F. L. WICKS, 359

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Erythroblastosis Fetalis*

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ERYTHROBLASTOSIS neonatorum or fetalis has become a term used in current literature to include the conditions known as hydrops fetalis, icterus gravis, and congenital anemia. These three conditions are all characterized by erythroblastemia and erythroblastosis. Each has been recognized for centuries. Ballantyne in 1898 collected 70 cases of hydrops fetalis from the literature since 1614. Icterus of the newborn was differentiated into physiological icterus and icterus gravis by Bloomfield in 1901. The familial nature of icterus gravis was noted by Buchan & Comrie and they also noted the large numbers of nucleated red cells in the blood and areas of hematopoiesis in the liver and spleen. In 1909, they stated that hydrops fetalis and icterus gravis were varying degrees of the same condition. In 1919, Ecklin correlated the regenerative (as opposed to the aplastic type) of congenital anemia, with hydrops fetalis and icterus gravis, under the common heading of erythroblastosis. This hypothesis was later confirmed by Abt, Diamond, Blackfan and Baty, and others.

Erythroblastosis, then, may be classified into three types: (1) the hydropic—one-third of cases, (2) the icteric—one-half of cases, (3) the anemic—one-sixth of cases. In most cases, there is an overlapping of symptoms, but the outstanding clinical feature is selected in classifying cases. In a few cases of erythroblastosis, hydrops, icterus, and anemia may all be absent at first and only a hemorrhagic diathesis or erythroblastemia may be apparent.

The diagnosis of erythroblastosis depends upon evidence of blood destruction plus evidence of abnormal blood regeneration—i. e., anemia plus erythroblastemia.

At autopsy areas of extramedullary hematopoiesis must be present, mostly in the liver and spleen, but often in the kidneys, adrenals, thymus, thyroid, pancreas, and various lymph nodes. The clinical symptoms of the triad are as follows:

1. Hydrops fetalis is the most acute and fatal form of erythroblastosis. It is characterized by universal edema which may be diagnosed antenatally by the Buddha-like posture of the fetus on x-ray and occasionally by the presence of a halo due to the edema of the fetal scalp. In addition to the universal edema, there are hepatosplenomegaly and erythroblastemia and anemia. The placenta is usually much larger than normal with a very pale maternal surface. It closely resembles grossly that found in congenital syphilis. The infant with hydrops fetalis usually is stillborn or dies within a few minutes.

2. Icterus gravis is the second most severe form of erythroblastosis. Most cases are jaundiced at birth and all within forty-eight hours. The icterus index is 100 plus. Often the vernix and amniotic fluid are stained yellow. The placenta is not enlarged. Hepatosplenomegaly are usual. There are anemia and erythroblastemia as in hydrops. The prognosis in icterus gravis is slightly better than in hydrops, as will be discussed later.

3. Congenital anemia of the newborn, of the regenerative as opposed to the aplastic type, is the third and most benign type of erythroblastosis. There is no edema and no jaundice and usually no hepatosplenomegaly. There is a reduction in hemoglobin and red blood cells with erythroblastemia.

Incidence. The incidence of erythroblastosis has been variously estimated. Javert in 1936 stated that it occurred

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about once in 438 deliveries. Burnham recently estimated the incidence as once in 200 deliveries and stated that the apparently increased incidence is due to increased interest and awareness of the condition as a result of recent discoveries as to its etiology.

The incidence in mothers who have previously given birth to erythroblastic infants is at least 50 per cent, as will be discussed later. About 85 per cent of the cases occur in multiparas.

Etiology and Pathogenesis of Erythroblastosis

The relatively recent discovery of the etiology and pathogenesis of erythroblastosis was the result of the discovery, in 1940, by Landsteiner and Weiner, of a new blood group factor in man, following the injection of rabbits with the blood of the Macacus Rhesus monkey. The serum of the immunized rabbits clumped not only the blood cells of the Rhesus monkeys but also the blood of about 85 per cent of white human beings, irrespective of their blood groups. This factor was designated Rh, because it was first found in the Rhesus monkey. Previous to this discovery, it had long been known that it was dangerous to transfuse a pregnant or parturient woman and frequent transfusion reactions had been noted even when the blood used was of the same group and had been carefully checked for compatibility by cross matching. In 1939, Levine and Katzin suggested that in one instance, such a transfusion accident was due to immunization of the mother by factors in the fetus, inherited from the father. This immunization resulted in the formation of an atypical agglutinin in the mother's blood which agglutinated a large per cent of cells of the same group. Later analysis (1940) of 12 cases in which atypical agglutinins could be demonstrated, revealed that these patients had abnormal obstetrical histories with a high per cent of toxemias, macerated fetuses, abortions and stillbirths. In March, 1941, Levine, Katzin and Burnham reported five cases with atypical agglutinins and of these, three gave birth to infants with erythroblastosis. They then propounded the theory that iso-immunization of the mother to a factor (or antigen) in the blood of the fetus, may, under certain conditions result in the formation of agglutinins (or antibodies) in the mother's blood. These agglutinins then may penetrate the placental barrier and by their continued destructive action on fetal blood cells, they may produce erythroblastosis in the fetus. Levine and his co-workers thought these agglutinins paralleled the anti Rh agglutinins discovered by Landsteiner and Weiner in 1940.

It was then concluded that the Rh factor is an antigen, present in the red blood cells of 85 per cent of white human beings, those who have the Rh factor being designated Rh positive and the other 15 per cent, whose red cells lack the factor, being Rh negative. Their conclusions were that most (93 per cent) erythroblastoses and most transfusion reactions of pregnant and parturient women, occurred as the result of iso-immunization of an Rh negative mother by an Rh positive fetus, the Rh factor in the fetus being inherited from an Rh positive father as a Mendelian dominant.

Burnham, in September 1941, further stated that, should an Rh negative mother need a transfusion and should the transfused blood contain the Rh antigen (i. e. Rh positive) the destructive agglutinins in the mother's blood, produced by an immunologic incompatibility between the fetus and the mother, agglutinate and hemolyze the transfused blood. This gives rise to the oliguria or anuria with its so often fatal consequences. Of interest also is the concept that repeated transfusions of any Rh negative patient (not pregnant) with Rh positive blood, may result in the formation of anti Rh agglutinins and this accounts for many of the reactions so frequently noted in repeatedly transfused patients.

Thus it is now definitely established that erythroblastosis is caused by iso-immunization of the mother by a dominant hereditary blood factor in the fetus; most frequently the Rh factor. In more than 90 per cent of the cases, the father and the fetus are Rh positive and the mother Rh negative. Failure to demonstrate such a relationship in about 10 per cent of the cases does not mean that the theory is incorrect, but that there are other as yet undemonstrated factors which result in iso-immunization of the mother. The Hr factor of Levine's is no doubt one of these and there are probably others. In addition, it is now known that there are at least three varieties of anti-Rh sera and the use of all three may be necessary to detect evidence of iso-immunization.

An interesting bit of evidence for the further support of the iso-immunization theory has recently been derived from the varying incidence of the Rh factor in several different races. These results indicate that the incidence of erythroblastosis in any race is directly proportional to the incidence of Rh negative individuals.

White—85 per cent Rh positive, 15 per cent Rh negative—2.1 per cent erythroblastosis.

Negro—95 per cent Rh positive, 5 per cent Rh negative—0.7 per cent erythroblastosis.

Chinese—99.3 per cent Rh positive, 0.7 per cent Rh negative—*very rare* erythroblastosis (none in 17,000 deliveries).

Mechanism of Transplacental Immunization

To summarize, so far, then, erythroblastosis fetalis is caused by the formation in an Rh negative mother, of anti-Rh agglutinins, which pass through the placenta to react with the Rh positive red cells of the fetus and to destroy them. The father must have the Rh factor in his blood (Rh positive) to transmit it to the fetus. There must be a free exchange of antigens and antibodies through the placenta from the fetus to the mother and there must be a mechanism by which the Rh positive fetal cells can escape into the Rh negative maternal circulation. Previously, it had been assumed that no formed factor, such as the fetal red cell, could be transmitted through the placental barrier. Levine assumes that minute quantities of fetal blood enter the maternal blood stream in all pregnancies, but that iso-immunization occurs only when the mother is Rh negative and the fetus Rh positive and then only if the mother has the genetic capacity to produce antibodies.

One other question arises: If 85 per cent of the white population is Rh positive and 15 per cent Rh negative, statistically 13 per cent of all matings should be between an Rh positive husband and an Rh negative wife. However, only about one in 200 deliveries results in the production of an erythroblastotic infant. Apparently, there are several factors of safety:

First, the tendency toward small families. The first child frequently escapes and occasionally several pregnancies are necessary to produce immunization.

Second, genetically, if the father is heterozygous Rh positive, only 50 per cent of the infants will be Rh positive and capable of immunizing the mother. On the other hand, if the father is homozygous Rh positive, 100 per cent of the offspring will be Rh positive and should immunize the Rh negative mother.

Third, the mother, in spite of being Rh negative, may be genetically incapable of producing antibodies. It is probable that for every family in which even the first Rh positive child is affected, there is at least an equal number of families in which the first three or more Rh positive children are normal.

So much for theory—Let us consider some of the practical applications of the newer knowledge of erythroblastosis.

First: Antepartum diagnosis is important to enable us to initiate prompt and adequate treatment of the infant. The most important aid to antepartum diagnosis is an awareness of the significance of previous obstetric history of stillbirths, unexplained neonatal deaths and jaundiced infants. These patients and their husbands should be checked for the Rh factor. I shall not go into details as to the technic of testing except to state that anti Rh serum for checking is now commercially available and the tests are done much as blood typing is done except that the serum and cell suspension is incubated at 37° C. for 1 to 1½ hours before reading. An Rh negative woman, with an Rh positive husband, who, from her history, has had an affected infant, will have at least a 50 per cent chance of producing an erythroblastotic infant. The demonstration of isoagglutinins in the mother's blood by the technic of Levine proves the intrauterine presence of an erythroblastotic infant. For some reason, however, the agglutinins will be demonstrable only in about 50 per cent of the cases. They probably are present in the blood earlier in pregnancy and later disappear or at least cannot be demonstrated by the relatively crude methods at our disposal. Evidence of isoagglutinins in the blood, when present, is of great practical importance also in selecting donors for pregnant or parturient women and also for patients who have had repeated transfusions. When isoagglutinins are present, only Rh negative blood should be used for transfusion.

The diagnosis of erythroblastosis after delivery is simple in the hydropic infant, there being marked universal edema, hepatosplenomegaly, anemia and erythroblastemia. Unfortunately, most of these are born dead or die within a few hours, the longest reported survival being thirteen days.

The diagnosis of icterus gravis and congenital anemia may be more difficult. The presence of yellow vernix and

amniotic fluid is suggestive and the presence of jaundice at birth should be indication for immediate treatment. In suspected cases, one should take a sample of cord blood for immediate study. It has been shown that survival and absence of sequelae are directly proportional to the promptness and adequacy of treatment.

It might be well, here, to note the normal blood findings in the newborn: Hgb., 120 per cent (Sahli). Rbc., 5.5 million. Wbc., up to 20,000 per c. mm.—60 per cent pmn. Erythroblasts from 1 to 10 per 100 Wbc. up to the first forty-eight hours, then few or none.

If, then, one finds anemia, erythroblastemia, usually with hepatosplenomegaly, the diagnosis of erythroblastosis may be made and immediate treatment instituted.

These babies should be transfused, at once, in the delivery room. Levine and numerous other workers state that compatible Rh negative blood should be used, on the theory that the baby's own Rh positive blood is being destroyed by the iso-agglutinins transmitted to it from the mother. It should be emphasized that the mother's blood, though Rh negative, should never be used, since it contains agglutinins which further destroy the infant's red cells. Other workers feel that the use of Rh negative blood is not essential and some, especially R. W. Koucky, in a personal communication, feel that Rh positive blood is preferable. Koucky states that the damage to the infant after birth is due to the presence of the maternal antibodies fixed to the infant's blood cells and tissues. It seems necessary to eliminate these antibodies as soon as possible and Rh positive blood will neutralize and destroy them. The process of destruction is accompanied by hemolysis and jaundice but in his opinion, neither of these is injurious. He feels that damage to the infant and the possibility of late complications are reduced by the use of compatible Rh positive blood. It has been my experience that Rh negative blood is extremely hard to find in the small community. It would seem practical, then, to have an Rh positive group O donor immediately available and to transfuse the infant at once. Subsequently, blood should be obtained from a donor of the same group as the infant, as soon as typing and cross matching can be carried out. Certainly, there can be no objection to using Rh negative blood if it is available, but valuable time should not be lost in searching for such blood while the infant's condition is allowed to deteriorate. They should be transfused with about 10 cc. per pound every four hours until their Hgb. remains above 100 per cent and their Rbc. above 4.5 million. As a matter of fact, higher counts are desirable because the sequelae from which they suffer are believed to be due more to anoxia than to jaundice or other toxic factors. In addition to intensive transfusing, these infants should have premature care and plenty of oxygen.

PROGNOSIS

In the hydropic infant, as was stated earlier, the prognosis is very poor. These infants have been severely damaged before birth and the outlook is practically 100 per cent fatal. One of the cases which I shall report, however, will prove that this is not necessarily true when early treatment is carried out intensively.

The cases with icterus gravis carry a better prognosis. Javert, in 1942, reported 22 cases with a mortality of 54 per cent. With the new knowledge of the importance of early transfusions, it seems likely that this per cent will be considerably reduced. The incidence of sequelae in the jaundiced erythroblastotic has previously been stated to be high, especially in those having exhibited the syndrome known as kernicterus—i. e., icterus of the basal ganglia of the brain with opisthotonus, respiratory depression and later mental or physical deficiency. Juvenile cirrhosis of the liver has also been noted as a sequela. Merritt states that of 12 infants with icterus gravis who survived, 9 were well and 3 were defective, either mentally or physically. This per cent also should be improved by early and intensive treatment.

The prognosis in the congenital anemias is excellent and recovery without sequelae can be expected with adequate treatment.

One should not leave the question of prognosis without discussion of the outlook for future pregnancies. Once a mother has given birth to an erythroblastotic infant, she has genetically no better than 50 per cent chance of delivering an unaffected infant. As a matter of actual experience, her chances, for some unexplained reason, are less than that, it being a known fact that she will, in most instances, continue to produce erythroblastotic infants. Recent, unpublished work, however, has shown that, with cesarean section done at 7½ months gestation, the outlook for survival of the infant can be considerably improved. The severe damage to the infant apparently takes place in the last four to six weeks of gestation, provided the fetus has survived up to that time. We can give these women who have had repeated tragedies some hope of survival for the infant for doing a section at 7½ months. This would seem, at first glance, to be radical treatment, but Koucky, in a series to be published later, shows a high rate of survival when the section was done not later than eight months gestation.

I have a brief report on three cases of erythroblastosis discovered in my own relatively small obstetric practice in the past 20 months.

Case 1. Mrs. O. J. Age 40 years. First seen in September 1942, at 7 months gestation. General physical examination negative. Wassermann negative. Laboratory findings normal. Estimated date of confinement, November 8. Past history, cholecystectomy, 1928, stones.

By a previous marriage she had two children, ages 16 and 18 years, living and well. Fourteen years ago had had a premature stillbirth at 6 months gestation, cause unknown. This present pregnancy was the first in her second marriage. Pregnancy was uneventful until November 5, when she complained of mild generalized abdominal pain and nausea. She was hospitalized and continued to vomit occasionally until delivery on November 12, 1942. After a short, normal labor, she delivered a living male infant weighing 6½ lbs., in apparently good condition. On the third day, icterus was noted but it was not unusually marked and the infant's general condition was good. On the morning of the fourth day he was acutely ill, deeply jaundiced, temperature 104°. He

was given subcutaneous fluids and 50 cc. of blood from the mother, which was compatible. In spite of supportive treatment, he expired on the same day. This mother was found to be Rh negative, the baby and the father Rh positive and the mother's serum showed isoagglutinins. I feel sure, in the light of present knowledge, that this baby could have been saved had he been treated early and adequately. He should have been transfused as soon as the jaundice was noted and he should definitely have not received the mother's blood.

The *second case* illustrates the severe type of hydrops with early premature delivery, with a hopeless prognosis.

Mrs. H. T., a 32-year-old gravida IV, had one child aged 8 years, living and well, the result of her first pregnancy. Her second pregnancy, three years ago, resulted in a macerated stillborn fetus at 6 months gestation. Her third pregnancy one and one-half years ago, resulted in a spontaneous abortion at 3½ months. She was first seen in this pregnancy on November 13, 1943, at which time physical examination and all laboratory tests were normal. Her expected date of delivery was June 25. On April 22, she showed signs of toxemia with hydramnios, blood pressure 150/90 and marked edema of feet and ankles. She went into labor on April 25 and delivered a male infant with severe hydrops, who gasped a few times and expired. The mother was Rh negative, the father, the newborn, and the 8-year-old boy were all Rh positive. The mother's serum showed anti-Rh agglutinins.

The *third case*, Mrs. J. W., aged 30, gravida IV, was first seen on April 11, 1944. She had one living female child, age 7 years, the result of her first pregnancy. This child had been severely jaundiced and had been given seven injections of intramuscular whole blood during the first fifteen days of her life. She was perfectly normal at present.

The second pregnancy, four years ago, resulted in a stillbirth at 8 months gestation. Third pregnancy, three years ago, also resulted in a stillbirth at 8 months gestation. Nothing is known of the condition of these infants. Rh tests done on this patient and her husband in April, 1944, showed her to be Rh negative, her husband RH positive. Her expected date of delivery was July 26. On June 14, her serum was checked against the cells of six known Rh positive people of the same group, in an effort to demonstrate the presence of anti-Rh agglutinins. Her serum failed to agglutinate any of them. Her length of gestation at that time being 7½ months, the situation was carefully explained to her and her husband and they elected to chance a cesarean section. Low cervical section was done on June 15 and a definitely hydropic male infant, weight 6 pounds 10 ounces, was delivered in good condition. Immediate blood studies were made, but, without waiting for reports, transfusion with Rh positive, group O blood which had been drawn before delivery, was begun at once. The baby showed 3,040,000 Rbc., 68 per cent Hgb., was Rh positive, had 0.6 per cent nucleated red cells, and was group O.

He was given a total of 300 cc. of group O Rh positive blood by slow continuous drip in the first twenty-four hours, at which time his Hgb. was 136 per cent,

Rbc. 8,520,000. By the second day he had developed a marked icterus with respiratory depression and opisthotonus. He became very toxic and had a very stormy time and was transfused on two more occasions, to a total of about 450 cc. of blood all told. He also developed a pulmonary infection on the sixth day, for which penicillin (2500 units every three hours) was given, with rapid recovery. He was given continuous oxygen for two weeks. He promptly lost his edema, his weight on the sixth day being only 5 pounds 15 ounces.

He remained very jaundiced and continued to retract his head until three weeks of age when a very definite improvement was noted. At the present time, age four weeks, he is taking formula well, is only slightly jaundiced, and weighs 6½ lbs. His Hgb. remains at about 110 per cent, his Rbc. 5,100,000. I believe that this baby, who was definitely hydropic, will live.† Whether he develops cerebral sequelae as a result of his kernicterus, only time will tell.

In conclusion then, it seems definitely proven: (1) That erythroblastosis fetalis is, in over 90 per cent of the cases, the result of an antigen-antibody response in an Rh negative mother, as a result of immunization by an Rh positive fetus, the Rh factor being inherited from an Rh positive father as a Mendelian dominant. (2) That the prognosis for these infants can be improved by antenatal diagnosis and prompt and adequate treatment.

†This baby developed cerebral spastic diplegia and died with convulsions and extreme hyperthermia at the age of five months.

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The Detection of Pulmonary Tuberculosis on Induction into Military Service*

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THE fact that men are being discharged from the military service because of pulmonary tuberculosis should not be at all shocking to members of the medical profession because we are all aware that the detection of pulmonary tuberculosis, even after meticulous and prolonged study of the patient, is often difficult. We are all further aware that even in the hands of the best trained and most skillful diagnosticians a certain percentage of error will prevail.

There is general agreement that the omission of x-ray examination of the chest of approximately a million persons inducted into the armed forces early, left the diagnosis of tuberculosis in the same precarious position that it had occupied during World War I. It has been shown that failure to detect tuberculosis during that war left us with an enormous economic burden—a burden which we are still bearing today.⁵ The fact that 5,000

*See Editorial on page 33.

men have already been discharged from the military service with a diagnosis of pulmonary tuberculosis is not as appalling as it would seem at first glance. Since approximately 1,000,000 men were inducted without benefit of x-ray examination—a failure which is admitted and which cannot now be remedied—and since the expected incidence of pulmonary tuberculosis is approximately 1 per cent, it is obvious that 5,000 cases of pulmonary tuberculosis could be detected in this group alone, and still be well within the limits of the anticipated incidence. In fact, we must believe that many cases of pulmonary tuberculosis in this group of a million persons have as yet escaped detection, a fact which is perhaps more deplorable than that 5,000 persons have been discharged with that diagnosis.

Once the routine use of x-ray examination of the chest was adopted, a decision had to be made as to

which method to employ. The choice was between the 14x17 stereoscopic, celluloid based film, the 14x17 single celluloid based film, the 14x17 single paper based film, the 4x5 stereoscopic photofluorogram, and the 35 mm. photofluorogram. The first of these is obviously the best available for accurate diagnosis; however, the time necessary to take, process and interpret this type of examination, as well as the cost of the procedure and the difficulty of storage of the films, made this method impractical for mass survey. The second method also presented the problem of time, cost and storage facilities. The third method, in addition to the drawbacks already mentioned, is not as easy to interpret nor do most interpreters feel that the method is as accurate. The 4x5 stereoscopic photofluorogram was selected by the army as the method of choice. This method is inexpensive, permits rapidity in exposure, processing and interpretation. It has the decided advantages afforded by stereoscopy and greatly facilitates handling and storage. Its diagnostic accuracy closely approximates that of the 14x17 single film, assuming that diagnosis is made by competent observers. The 35 mm. film is generally considered diagnostically inferior to the other methods. At the present time, with combined induction examination for the Army and Navy, the 35 mm. film is not routinely used.

The 4x5 stereoscopic film is, however, still in use and in an experience with 93,000 examinations by this method the author feels that it is at least equal to and often superior to the routine use of single 14x17 films. Many minimal lesions which were obvious on the photofluorogram were obscured by the bony thorax when examined with 14x17 single film, or were seen only with great difficulty in spite of the fact that the lesion was known to be present. There is no doubt that the diagnostic acumen of the observer is directly proportional to his experience with any method. It is true that most comparative studies have been made by men whose experience in interpretation is great, but they had ordinarily used 14x17 films and had no large experience with photofluorograms. Even assuming that there is a slight advantage in accuracy in the use of the 14x17 film, the other factors of speed, cost, handling and storage cannot be glibly brushed aside.

The fact still remains that whatever method is used a certain percentage of cases of pulmonary tuberculosis will escape diagnosis. The difference in error between the 14x17 and the 4x5 stereo is certainly not sufficiently great to outweigh the other advantages afforded by the photofluorographic method, and, in fact, we believe that with adequate experience in the interpretation of these smaller films, the difference in diagnostic accuracy would prove negligible.

Admittedly, parts of the lung are obscured from view whatever method of x-ray examination is used; nevertheless, no practical method is today known for mass survey which will permit diagnosis of tuberculosis in these obscured areas. We agree with Myers that lesions thus beneath the range of unaided human vision will often progress and become apparent on films taken

three to six months later. Many sources of error account for the admission of persons with pulmonary tuberculosis into the armed forces. First, there is the human error in interpretation—an error which is bound to occur regardless of how good the technician or how good the interpreter. It is amazing that the percentage of error is not greater considering the fact that many of the radiologists interpreting chest plates at induction stations have had but meager experience in this field prior to their army work. This in turn is not the fault of placement personnel, but rather due to a shortage of qualified radiologists in the army. Secondly, errors are occasionally due to faulty personnel—a factor which is inevitable in any large organization. Furthermore, induction examinations, as is well known, are done under tremendous strain due to time factors and to the large number of examinations which must be accomplished. Under such conditions the examiner will make errors due to his weariness alone. To these sources must also be added the errors due to clerical faults where the diagnosis may be placed on the wrong individual. Considering these numerous sources of error, one can have no doubt that there are active cases of pulmonary tuberculosis inducted into the armed forces and that if periodic routine x-ray examination of the chest of persons in the military service were made, many cases would be detected in an early stage and the number of cases arising from such contacts could thereby be appreciably reduced. A second examination of the chest of military personnel six months after induction into the service would no doubt reduce the number of cases of tuberculosis in the armed forces to an unbelievably low figure and would permit the detection of many of those cases which had previously been below the range of human vision. We agree with Myers that such a plan would be of inestimable value in tuberculosis detection, but it is not within the province of the writer to pass judgment on its practicability for the Army.

Routine x-ray examination of the chest is done at the time of discharge from the military service. A comprehensive review and comparison of the induction and discharge films of all military personnel will probably be eventually undertaken. The progress of pulmonary tuberculosis erroneously admitted to the military service can then be critically evaluated and the incidence of cases occurring during military service will become apparent. If in addition periodic films of the chest were available for comparison, much valuable information concerning the pathogenesis of pulmonary tuberculosis would become available to supplement the work of such men as Rigler, Barnwell, Malmros and Hedvall.⁴

Of what additional value would the tuberculin test be? Let us assume that this test be carried out on inductees. First, the problem of where the test is to be given must be settled—shall it be the local community or the induction center? If it be in the former, many interpreters would have to be utilized. Certainly if there would be disagreement of interpreters of x-rays in as many as 25 per cent, there would be at least as much disagreement in interpretation of the tuberculin test. Lees¹ in a survey of tuberculin testing of freshmen col-

lege students in the East found the positive reactors to range from 8.8 per cent to 48.1 per cent in colleges drawing from essentially the same communities. He attributes this wide discrepancy to a difference in interpretation of the positive reaction. If the test were to be given at the induction center, the problem of housing these men for at least forty-eight hours would arise and this generally meets with the disapproval not only of the military personnel, but also of the inductees and their local selective service boards. Secondly, should all these men then be radiographed, or only the positive reactors? If only the positive reactors are to have roentgenograms, much pulmonary disease other than tuberculosis would obviously escape detection. If all are to have roentgen examination in addition to the tuberculin test, what has been gained by this testing? Fifteen to twenty per cent of persons of the age group now taken into the military service would prove to react positively to the tuberculin test. Some of these positive reactors have pulmonary lesions sufficiently large to be detected on x-ray examination and which are clinically significant (5 per cent). The other 95 per cent of these positive reactors exhibit either clinically insignificant lesions, lesions too small to be detected, lesions which lie in obscure portions of the lung, or even lesions in other parts of the body. "The tuberculin test means that at some time or other the individual has had a tuberculous infection. It does not tell whether or not the infection is active at this time, nor if it is in the lung or some other organ in the body."² Certainly it would not be feasible to reject all positive reactors and as has been stated, it is somewhat impractical to get periodic chest x-rays during war time, although theoretically this would be the ideal course to pursue.

Those persons rejected from military service with an erroneous diagnosis of tuberculosis may have been spared some mental anguish it is true; however, they would probably have been considered unacceptable anyway. Furthermore, it has been the author's experience that in some instances where a lesion has been diagnosed as a questionably stable pulmonary tuberculosis the tuberculin test has also been doubtfully positive. To subject the entire personnel of the armed forces to periodic tuberculin tests is also not feasible.

In public health programs of case finding, tuberculin testing is carried out routinely, but the final diagnosis as to the presence or absence of pulmonary tuberculosis rests in most instances in the hands of the radiologist. True, the army has omitted tuberculin testing in its case finding program, but every inductee whether a posi-

tive reactor or not is given the advantage of x-ray examination.

SUMMARY

The error of not procuring x-ray examination of approximately one million men inducted into the armed forces is admitted. Subsequently, most of these service men were x-rayed and persons with pulmonary tuberculosis were discharged.

The use of the 4x5 stereo photofluorograms by the army in its induction program is not at all deplorable because in the hands of persons experienced in this method the percentage of error is probably not appreciably greater than when the more conventional methods are used. Furthermore, the factors of time, cost, and ease of handling and storage cannot be completely dismissed.

That a certain number of cases of tuberculosis will be missed because of the physicians' inability to detect the presence of tuberculosis by x-ray examination is also admitted; but, since no better method to detect its presence is as yet available, tuberculin testing notwithstanding, it would appear that x-ray examination is preferable. The cases rejected for pulmonary lesions called tuberculosis and which subsequently prove to be non-tuberculous are in most instances not acceptable for military service in any event, and the injustice done the patient in producing mental anguish is far outweighed by the fact that further investigation is usually instigated and clarification and treatment of the lesion, which might otherwise be delayed, is undertaken.

It has been pointed out that tuberculin testing is not without error and that such a program for induction into military service has many undesirable features; although, theoretically, routine periodic skin testing and periodic x-ray examination of the chest is admittedly the ideal method for case finding. The aim of the induction program is to screen out cases of pulmonary tuberculosis. It is not its aim to predict who will subsequently develop tuberculosis—a prediction which in all probability cannot be made even with a careful tuberculin testing program. On a theoretical basis a more ideal tuberculosis detecting program could be outlined. On a practical basis, a program closely approaching the ideal for induction into the military service has been attained. A second radiographic examination of the chest six months after induction would be of inestimable value.

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The American College of Surgeons announces that 3,152 hospitals in the United States and Canada are included in the 1944 Approved List. A total of 3,911 hospitals were included in the 1944 survey and the approved hospitals represent 80.6 per cent. The first annual survey in 1918 included 692 hospitals of 100 beds or over of which only 89 or 12.8 per cent merited approval. Hospitals of 25 beds and over are covered in the current surveys. On December 31 of each year the ratings of hospitals under survey by the American College of Surgeons automatically terminate. The status of every hospital based upon all data collected from the current survey is reconsidered each year.

Indications for the Surgical Treatment of Peptic Ulcer*

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THE treatment of peptic ulcer is particularly important during the present war because a significant increase in the incidence of the disease, as well as in gastroduodenal disorders in general, is anticipated during this period of anxiety and stress. Experience after the First World War makes this outlook plausible.

DUODENAL ULCER

Uncomplicated duodenal ulcer is considered to be a problem for the medical therapist. Everyone engaged in the treatment of gastrointestinal diseases recognizes, however, that many patients suffer from a duodenal ulcer which no longer can be controlled by the usual medical measures. Just as there are criteria which help one to decide that medical treatment of a duodenal ulcer is best, so there are certain criteria which determine that surgical exploration of the ulcer is advisable. The indications for the surgical treatment of duodenal ulcer can be briefly listed as follows: (1) failure of the ulcer to heal under good medical treatment, even though the lesion is objectively uncomplicated; (2) acute, subacute and chronic perforation and a lesion of large size, particularly if it has penetrated into a neighboring viscus; (3) impairment of gastric motor function owing to inflammatory pyloric obstruction, cicatricial pyloric change, or extensive perigastric and periduodenal adhesions; (4) repeated massive hemorrhage; (5) associated disease of the gallbladder or appendix or a concomitant gastric ulcer, and (6) environmental and economic factors interfering with maintenance of an adequate medical regime.

Although this summary suggests that the indications for operation in cases of duodenal ulcer are clear-cut and definite, this is unfortunately not so and one must concede that the subject is still controversial and debatable. Only as clearly defined indications are accepted and followed by conscientious and competent internists and surgeons will a better understanding of this question be achieved. It is evident that poor results follow the medical treatment of some duodenal ulcers. It is equally true that the surgical treatment of duodenal ulcer is not always followed by cure. Each patient presents an individual problem and must be evaluated from this standpoint if the results of treatment are to be satisfactory.

I wish to emphasize that there is no single cause for duodenal ulcer. This must be understood if the treatment of duodenal ulcer is to be properly outlined, whether such treatment is medical or surgical. An intelligent approach to treatment is based on a knowledge of the multiple etiologic factors concerned and on an appreciation of the disturbances of normal gastroduodenal physiology which may be either the cause or the result of the duodenal ulcer.

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A most important, if not the most important factor in the cause of duodenal ulcer is excessive acidity of the gastric contents. It is generally accepted now that an active duodenal ulcer does not exist in the absence of free hydrochloric acid. It is characteristic for patients with duodenal ulcer to have a hyperacidity and even a hypersecretion of a highly acid gastric juice. The experimental work of Hay, Varco, Code and Wangenstein¹ demonstrated the importance of acidity of the gastric contents in the production of peptic ulcer.

The natural defensive mechanisms active in the duodenum, which prevent the occurrence of duodenal ulcer in everyone, are closely linked with acidity of the gastric contents in the production of duodenal ulcer. These factors are inherent in the cells of the duodenal mucosa and are related to the secretions formed by the glands of the duodenum and to those secretions which are emptied into the duodenal lumen by the pancreas and the liver. Some of these factors are poorly understood and none of them lend themselves to easy evaluation and measurement.

The neurogenic factor is one of the most important factors in the production of duodenal ulcer. This factor may be significant in its own right or it may work through one of the previously mentioned factors of acid erosion and tissue defense. The typical dynamic, aggressive, high-strung personality often noted in patients with duodenal ulcer antedates the symptoms of ulcer in every case and may be aggravated by the onset of pain. The psychoneurologic symptoms most often seen in these patients are hyperirritability, tenseness, anxiety, restlessness, sensitivity and emotional instability. Patients with characteristic psychosomatic patterns who have duodenal ulcer need to be educated to achieve personality adjustments which will overcome a tense, anxious, nervous background. This is as important in cases in which patients are to be treated surgically as it is in those in which medical treatment is to be employed.

Other factors such as infection, trauma and faulty nutrition play a role in the cause of ulcer although, for the most part, this is a minor role as compared with that played by the factors already mentioned.

Recognition of these varied causative factors of duodenal ulcer emphasizes the need for modifying the treatment program so as to neutralize them, whether the treatment is to be surgical or medical. Unless this is done, the results are doomed to failure.

In duodenal ulcer, as in other benign diseases, if operation is decided upon, there are two important considerations. The first is the risk to life entailed by the type of treatment employed and the second is the chance of complete symptomatic relief by arrest of the disease through the treatment employed. A survey of the causes of duodenal ulcer emphasizes that multiple factors are concerned and suggests that multiple factors are operative in the cure of the lesion. For this reason, generaliza-

tions as to the results of treatment are misleading and inaccurate. When one tries to evaluate the results of the medical treatment of duodenal ulcer he finds that the treatment outlined by one physician may vary considerably from that outlined by another. Furthermore, the inconsistent cooperation of the patient adds a variable factor which cannot be measured. Therefore, an accurate comparative evaluation of the results of the medical treatment of duodenal ulcer is impossible, particularly if reports by different authors are compared. What thus applies to the medical treatment of duodenal ulcer applies equally to its surgical treatment. Because the results of the surgical treatment of duodenal ulcer largely depend on an alteration of the physiology of the stomach and duodenum, much depends on the technical aspects of the operative procedure performed. The postoperative care and the accuracy with which measures to correct the primary etiologic factors are followed after operation, also affect the results materially.

Complications. The important complications of duodenal ulcer which warrant surgical interference are: (1) intractability of symptoms and the failure of medical treatment; (2) perforation; (3) obstruction; (4) hemorrhage, and (5) other factors.

Intractability of symptoms. In evaluating this complication of duodenal ulcer, hasty judgment is certain to lead to error. A characteristic feature of the symptoms of duodenal ulcer is their intermittency or periodicity. Many patients are self-taught that minor dietary adjustments will suffice to bring relief of symptoms. Often for many years they treat themselves inadequately, following minor restrictions of diet and habits when experiencing recurrent symptoms only to revert to their former habits as soon as their symptoms have been brought under control. As a result, they often have had a lesion for many years before they first seek medical advice and they consult a physician only because their symptoms have become practically continuous and can no longer be controlled by measures formerly found to be effective. In such cases the lesions still may be controlled by adequate medical treatment, and if the fullest cooperation of the patient can be obtained, surgical treatment may not be necessary. In evaluating the intractability of a duodenal ulcer it is important to ascertain not only the type of treatment which was outlined for the patient but also the type of treatment which has been followed. Proper interpretation of residual symptoms is sometimes clouded because a sharp and clear-cut differentiation of the organic and functional features of the disease may be extremely difficult. If one is satisfied that the symptoms cannot be controlled with a fair degree of certainty with medical measures and that the patient is suffering from repeated attacks of disabling pain, operation should be performed even though no other complications are known to exist.

Perforation. Whether perforation is acute, subacute or chronic, adequate results will not be achieved except by some surgical procedure. When an acute free perforation occurs, immediate operation is obligatory. The prognosis of this surgical emergency is directly dependent on the rapidity with which the diagnosis is made and treatment instituted. This complication is attended by a low mor-

tality if properly treated within the first hour after its occurrence. The mortality rate rises sharply in cases in which treatment is delayed appreciably. The surgical procedure for acute free perforation should be as simple and as easily performed as is commensurate with adequacy. It usually should be confined to purse-string closure of the perforation and reinforcement of the closure with a piece of omentum.

Chronic perforation is seen in lesions involving the posterior wall of the duodenum and occurs in active and usually long-standing ulcers. If the penetration involves the pancreatic structures extensively, the symptoms which result are intractable and are uncontrollable by medical measures. Surgical treatment should be carried out; it should consist of posterior gastroenterostomy or subtotal gastric resection with an attempted excision of the ulcer.

Obstruction. Persistent obstruction at the pylorus is a compelling indication for operation. When confronted with an ulcer which is disturbing gastric motility, it is important to determine whether this finding is due to an inflammatory constriction of the pylorus, or to fibrous tissue contracture or to postinflammatory peridiudenal or perigastric adhesions. Inflammatory narrowing of the pylorus often responds well to conservative medical treatment, whereas a narrowed outlet caused by true fibrous tissue change can be corrected only by an operative procedure. Hinton² has stated that a stenosing or obstructing duodenal ulcer not accompanied by pain may not require surgical treatment but that the obstruction is often due to edema or pyloric spasm rather than scar tissue and will therefore respond to medical measures. A week of intensive hospital treatment should suffice to establish this differentiation with certainty. At the end of this period, any persistent pyloric obstruction will almost certainly prove to be of a cicatricial nature and will necessitate surgical intervention. If the pyloric obstruction is of long standing and if there is much vomiting, there may be a serious disturbance in the electrolyte balance of the blood serum and severe secondary azotemia may be present. Proper preoperative treatment, designed to restore the fluid balance and correct the disturbance in the chemical composition of the blood will bring about improvement in the general status of the patient so that no extraordinary hazard will accompany the surgical procedure. The following case emphasizes how seriously ill the patients can become and yet recover under appropriate treatment.

A man, aged fifty-eight years, had had symptoms of recurrent epigastric distress, characteristic of duodenal ulcer, for more than ten years. In 1930, a duodenal ulcer had been demonstrated by roentgenoscopy and medical treatment had been outlined. He had followed the recommendations indifferently and in 1939, had had a severe exacerbation of distress which had necessitated hospitalization. In 1940, his ulcer had caused him much distress. In October of that year, he had had a small hemorrhage with hematemesis and melena, and evidence of obstruction with much vomiting had developed. He had not sought medical advice at once, but had modified his diet and attempted to control the pain by the use of large quantities of sodium bicarbonate. He had become progressively worse until he had become bedridden. When admitted to the hospital he was extremely emaciated and dehydrated. He was disoriented and semicomatosc. The chemical composition of the blood was profoundly disturbed. The value for blood urea was 444 mg. per 100 cc.; the value for the plasma chlorides was 392 mg. for

100 cc. and the carbon dioxide combining power of the blood plasma was 129.3 volumes per 100 cc. Gastric lavage revealed retention of foul rancid gastric contents.

Treatment included gastric lavage twice daily, and the daily intravenous infusion of 3,000 cc. of 10 per cent solution of dextrose in physiologic salt solution, supplemented by ascorbic acid, nicotinic acid and thiamine chloride. Improvement was prompt and sustained; by the end of two weeks, he was mentally clear and the values for the blood urea, plasma chlorides and carbon dioxide combining power were normal. One month after his admission to hospital he had recovered sufficiently so that an operation was feasible. A posterior gastroenterostomy was performed for an obstructing duodenal ulcer. He recovered without incident and when he was seen one year later he looked well and was free of symptoms.

The kind of operation to be performed for pyloric obstruction due to duodenal ulcer depends on the general status of the patient's health, his age, and certain technical factors encountered at the time of exploratory operation. Either a posterior gastroenterostomy or a subtotal gastric resection should be performed.

Hemorrhage. The treatment of an actively bleeding duodenal ulcer is a controversial subject. It is an important question when one realizes that approximately 20 per cent of all duodenal ulcers bleed at some time or other. The published statistics of the mortality in the medical treatment of bleeding peptic ulcer are confusing because of the lack of generally accepted criteria as to the severity of the bleeding. One who includes in his series bleeding of variable severity will have a much more favorable mortality rate than will one who confines his statistical analysis to those cases in which an exsanguinating hemorrhage has occurred. Finsterer,³ one of the proponents of the surgical treatment of bleeding peptic ulcer, reported a mortality rate of 5.1 per cent in the surgical treatment of actively bleeding ulcer. This is a very favorable mortality rate and one which compares well with the best mortality rates for the medical treatment of hemorrhage in cases of peptic ulcer. However, the problem is not as simple as this would suggest. Blackford and Cole⁴ pointed out that fatal hemorrhage from peptic ulcer is unusual in the case of persons less than forty-five years of age. They said that in cases in which the patients are young, fatal hemorrhage from peptic ulcer is so rare that one probably is never justified in performing an emergency operation. In cases in which the patients are more than forty-five years of age, the percentage of deaths from exsanguination presents a different picture. Blackford and Cole noted that in 49 of 51 cases in which fatal hemorrhage resulted from peptic ulcer the patients were more than forty-five years of age. The surgeon is certainly justified in attempting to stop such hemorrhage by operative measures. Finsterer showed that if operation is to be performed with a reasonable risk in cases of actively bleeding peptic ulcer it must be done within twenty-four or forty-eight hours after the onset of hemorrhage. Gordon-Taylor,⁵ championing Finsterer's stand on this question, made the following statement, "Finsterer's first forty-eight hours is still the optimum period for surgical attack in hematemesis, and the golden age of gastric surgery will have been attained only when all cases of hemorrhage from chronic ulcer come to operation within that space of time." In the vast majority of cases, however, there will be a spontaneous arrest of

bleeding within this interval; therefore, it seems hardly fair to subject this entire group of patients to surgical exploration in the hope of being able to operate during the most favorable period, upon those who will eventually fail to experience spontaneous arrest of hemorrhage and will need to undergo an operation as a last heroic measure.

Despite the claims of the most ardent proponents for surgical treatment of an actively bleeding peptic ulcer, the over-all risk of operation is greater than is that of medical treatment. Until there is an infallible method by which one may recognize the patient who will not respond to conservative measures, it seems advisable to treat all actively bleeding peptic ulcers conservatively until it has been demonstrated that such measures will not arrest the bleeding. Operation should be reserved for those cases in which bleeding persists despite conservative measures. In the present state of medical knowledge, it is wrong to jeopardize the outlook of the many, in the hope of saving the few. With regard to the proper treatment, once active bleeding has subsided, I believe that operation is advisable in cases of repeated hemorrhage, particularly in cases in which the patients are fifty years of age or older. A subtotal gastric resection will give the best protection against recurrent bleeding, but a less radical operation, such as a posterior gastroenterostomy, may be advisable and has proved satisfactory.

Other factors. An important stimulus to the surgical treatment of peptic ulcer which appears to involve the first portion of the duodenum is doubt as to the true nature of the lesion. Since carcinoma of the duodenum is exceedingly rare, an ulcerating lesion in the first portion of the duodenum does not usually give any concern about the possibility of a neoplasm. However, under certain circumstances it is difficult, if not impossible, for the roentgenologist to ascertain whether or not the ulcer is actually on the duodenal side of the pyloric ring. Because of the proximity of such a lesion to the pyloric ring, response to medical treatment is poor and there is also a possibility that the lesion may be an early pyloric carcinoma. Radical operation is to be recommended in such a case. In cases in which the duodenal ulcer has been of long duration and it is believed that a complication is threatening, it may be wisest to recommend an exploratory laparotomy, particularly if the patient lives in a region remote from a hospital or a competent surgeon. Furthermore, there are patients whose economic status is such that it is impossible for them to maintain a satisfactory ulcer diet; therefore, operation will be necessary even though conservative measures might be satisfactory under more ideal circumstances. Associated lesions of the gallbladder and appendix must be removed. An associated gastric lesion is an indication for surgical exploration. Although no single relative factor is sufficient justification for operation, when two or more are present, operation deserves consideration. The patient must be considered as a whole and all factors making for success or failure, including the facilities available, the experience of the surgeon and the general condition of the patient, must be evaluated before making a final decision as to the type of treatment to be employed.

GASTRIC ULCER

Special mention should be made of the small circumscribed gastric ulcer. It is well recognized that a large majority of small circumscribed gastric ulcers are true peptic ulcers and benign in nature. It is equally true that certain small ulcerating carcinomas of the stomach may present a clinical picture which cannot be distinguished from that which may be associated with benign ulcer. The main differential points between benign and malignant gastric ulcers, namely the age of the patient, the duration and type of symptoms, the size and site of the lesion, achlorhydria and hyperchlorhydria, the roentgenographic and gastroscopic findings, and the response to medical treatment, may in certain cases be misleading. Walters, Gray and Priestley⁶ noted that 80 per cent of patients who underwent gastric resection for malignant tumor and who previously had received medical treatment for presumed benign ulcer experienced temporary relief from this form of treatment. They also noted that approximately 7 per cent of patients who underwent resection for malignant tumor of the stomach are less than forty years of age. Judd and Priestley⁷ said that in approximately one of five cases in which gastric resection is performed for carcinoma the value for the acidity of the gastric contents is normal or elevated. Alvarez and Mac Carty⁸ found that 92 of 100 benign gastric ulcers were less than 2.4 cm. in diameter but that 23 per cent of the gastric carcinomas resected at the Mayo Clinic were within the range of size of benign ulcers. There is no single clinical criterion which is dependable in making an accurate differential diagnosis of benign and malignant gastric ulcer. Walters⁹ emphasized that roentgenography and gastroscopy were not infallible aids in making a differential diagnosis of the character of the lesion.

Judd and Priestley⁷ estimated that once in 10 or 12 cases the clinical diagnosis of benign gastric ulcer will be in error and, in truth, carcinoma will be present. They reviewed 146 cases in which a diagnosis of gastric ulcer was made and a course of medical treatment was given. They found that a cure was obtained in less than 50 per cent of cases, that carcinoma developed subsequently in 10 per cent of cases, and that in 11 per cent of cases operation later was required for benign gastric ulcer because of the failure of medical treatment. Although these results leave much to be desired, they do not lead to the conclusion that all gastric ulcers should be treated surgically. Many small ulcerating lesions which have been present a short time and which are associated with an exacerbation of gastritis should be treated medically. Large penetrating lesions, particularly if they affect an elderly patient, and if they involve a portion of the stomach, which experience has shown has a predilection to become carcinomatous, should be considered surgical. Since the response of a gastric ulcer to medical treatment is a valuable criterion of the nature of the lesion and second only to surgical excision and histologic examination, an adequate trial of medical treatment for two or three weeks is an excellent aid in diagnosis. If a gastric ulcer heals when treated medically and remains healed for two years as far as can be determined by repeated roentgenographic and gastroscopic examinations, one can

be assured that he is dealing with a benign lesion. However, apparent healing as revealed by temporary roentgenoscopic and gastroscopic disappearance of the lesion is no assurance that the lesion is benign, as experience has proved several times.

Undoubtedly much valuable time is lost if a gastric ulcer is treated medically, appears to heal temporarily, then recurs after a further interval of time and is found to be carcinomatous. Admittedly, in such a case the prognosis is jeopardized by the delay in employing radical operation as the lesion is an early carcinoma. However, this sequence of events is uncommon, and it hardly seems fair to deny medical treatment a trial in the case of a small gastric ulcer if the ulcer seems to have a good chance of being benign as nearly as can be estimated by present-day clinical standards, simply because a few such lesions have been found to be carcinomatous. I wish to emphasize that no more than three weeks of supervised treatment are needed to determine whether a lesion is responding satisfactorily to conservative measures. In any case in which a gastric ulcer has not healed in that time, an exploratory laparotomy should be performed promptly. As long as a certain small margin of error in early recognition of a small carcinoma of the stomach is accepted as a lesser risk than operating for all small circumscribed ulcerating gastric lesions as soon as they are discovered, the trial of supervised medical treatment in selected cases of gastric ulcer is justifiable. Subtotal gastric resection is the surgical procedure of choice in dealing with gastric ulcer.

RECURRENT PEPTIC ULCER

Although operative procedures for peptic ulcer have been performed long enough to prove that highly satisfactory results follow a technically correct operation, secondary ulceration will follow in some cases regardless of the kind of operation performed. Walters⁹ found that subtotal gastric resection for benign gastric ulcer produced well-nigh perfect results. Similar good results were observed by Judd and Priestley.⁷ In the case of duodenal ulcer, the results are less ideal. Priestley¹⁰ expressed the opinion that if posterior gastroenterostomy is performed in properly selected cases the incidence of recurrent ulceration probably will not be more than 5 per cent. Lahey¹¹ said that the incidence of gastrojejunular ulcer after posterior gastroenterostomy is much higher than this. He reported seven proved instances of gastrojejunular ulcer after subtotal gastrectomy for duodenal ulcer in an unnamed number of cases.¹² In five of these cases the gastrojejunular ulcer responded well to medical measures; further operation was required in only two of the seven cases. Secondary surgical procedures in such complicated cases are usually difficult and hazardous but are necessary if a preliminary trial of medical treatment does not lead to healing of the ulcer.

GASTROJEJUNOCOLIC FISTULA

Undoubtedly one of the most serious complications of ulcer involving a gastroenteric stoma is gastrojejunocolic or gastrocolic fistula. Unless the lesion is corrected by operation, death is almost certainly the final outcome. The lesion is complicated by manifold evidences of mal-

nutrition. There usually are dehydration and extreme loss of weight and strength. Severe hypoproteinemia, nutritional edema, anemia and multiple vitamin deficiency states occur frequently. The risk attending the operation necessary to cure this complication has always been high. Gray and Sharpe,¹³ however, showed that adequate preoperative treatment designed to correct the dehydration, hypoproteinemia, and hypovitaminosis would materially lower what was formerly a prohibitive mortality rate. Proper preoperative preparation of the intestine by the use of a non-residue diet, colonic irrigations and recently developed sulfonamide drugs like sulfaguanidine or succinylsulfathiazole is also essential. Pfeiffer and Kent¹⁴ deserve great credit for showing that the once formidable risk of operation for the repair of gastrojejunocolic fistula can be largely avoided by performing a preliminary colostomy. This procedure is followed by improved nutrition and a gain in weight. It permits the second stage of the operation to be performed with a reasonable risk.

CHOICE OF SURGICAL PROCEDURE

Although much severe criticism has been leveled at posterior gastroenterostomy, I feel that there is a definite indication for this procedure. The results of subtotal gastric resection cannot be compared accurately with those of posterior gastroenterostomy for two reasons: (1) the former procedure is relatively new as compared with posterior gastroenterostomy and a long period must elapse before one can predict that all unfavorable complications after the procedure have been safely avoided, and (2) the procedure must be done for a long period and generally by surgeons of varying ability before its results can be compared with those of posterior gastroenterostomy, which has been done for a long time by surgeons of varying ability.

I believe that the existence in selected cases of more than one factor such as advanced age, poor general condition, low gastric acidity, absence of gastritis, a relatively inactive lesion, single ulcer, minimal neurogenic factors, favorable personal habits and technical difficulties which make gastric resection hazardous, warrants the performance of a posterior gastroenterostomy. Subtotal gastric resection with the removal of two-thirds to three-fourths of the body of the stomach is indicated if the patient is young or middle aged, if the patient is a good surgical risk, if the lesion is active and there is a history of subacute perforation and repeated hemorrhage, if the acidity of the gastric contents is high, if rather severe gastritis, multiple ulcers or marked neurogenic factors are present, if the personal habits of the patient are poor, if the economic status of the patient is unfavorable, and if the technical difficulties of such an operation are not too great. If patients to be treated by posterior gastroenterostomy are properly selected, a gratifying incidence of satisfactory results will be obtained. If posterior gastro-

enterostomy is performed without consideration in all cases of duodenal ulcer in which an exploratory laparotomy is performed, a high incidence of unfavorable results must be expected.

SUMMARY

The indications for operation in cases of duodenal ulcer are intractability of symptoms, perforation, repeated hemorrhage, obstruction and certain economic and environmental factors preventing adequate medical treatment.

Gastric ulcer presents a special problem because of the constant danger of carcinoma. If there is reasonable justification to believe the lesion benign, the use of a properly supervised program for three weeks is an excellent diagnostic aid. If the lesion fails to heal in three weeks or if certain criteria suggest that there is a likelihood that the lesion is malignant, surgical exploration should be performed at once.

Recurrent ulceration at the site of a gastroenteric anastomosis usually requires further operation although some ulcers of this type respond to an adequately supervised medical regimen.

It is my opinion that, despite much feeling to the contrary, there is a place for the time-honored posterior gastroenterostomy in properly selected cases of peptic ulcer. For an active duodenal ulcer and in cases of gastric ulcer and in cases in which ulceration occurs after operation the procedure of choice is subtotal gastric resection.

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Pregnancy and Diabetes*

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THIS is a relatively new subject. Most of us only occasionally attend a diabetic patient during pregnancy. However, since the general practitioner rather than the specialist, serves most patients of this category, I felt our society might be interested in an appraisal of the prevailing opinion on this subject.

First I wish to present two cases which exemplify some of the points to be made later.

Patient No. 1 (managed in association with a colleague‡): A young woman 28 years of age, whom I first observed on November 5, 1943, when she was somewhat less than eight months pregnant with fourth pregnancy. She has two children living and well. One child died aged one week, cause unknown. No known diabetic relatives.

About the end of the fifth month, sugar had been found in the urine and was found several times later. On November 5th, her blood sugar was 96 mg. per cubic centimeter of blood. During five days in the hospital she was sugar-free part of the time without insulin. She was again admitted on November 23. During this ten day hospital sojourn it required 15 to 20 units of insulin to keep her sugar-free part of the time. Her blood sugar was 200 mg. per cubic centimeter of blood. During three days in hospital preceding parturition there were two mild episodes of hypoglycemia. There was no evidence of toxemia any time during the pregnancy. A normal-sized child was born alive at term on December 29, 1943. During three days previous to and ten days after confinement, blood sugar ranged from 59 to 64 mg. per cubic centimeter. Normal puerperium. From two weeks previous to delivery and up to the present, patient has been sugar-free on a liberal general diet.

Patient No. 2: I first observed this young woman in 1932, at the age of 17. She was admitted complaining of boils, urinary frequency and weakness. The past history otherwise was not significant. One cousin is a known diabetic. Urine sugar was 4 plus, diacetic 2 plus. During this first hospital sojourn in 1932, she had one severe hypoglycemic reaction with a convulsion. During these twelve years, this patient has averaged at least two periods of several weeks twice every year in the hospital. Her problem was complicated by the fact that her home (until four years ago) was in a lumber camp 35 miles from town. She has always required (except near parturition) 60 to 90 units of insulin daily to keep her sugar-free for twenty-four hours. She was put on protamine zinc insulin in 1934. In 1938 she began to have distressing hives. On changing to zinc insulin crystals, the hives promptly disappeared. In two weeks part of the original dose of protamine zinc insulin was resumed and has been continued without allergic reaction. It has always been difficult to avoid hypoglycemia.

*Presented before Black Hills District Medical Society, Lead, S. Dak., February 24, 1944.

†Dr. Lyle Hare, Spearfish, S. Dak.

This patient first became pregnant and bore a 4 lb. child of seven months' gestation in 1939. The child died in three hours. There was toxemia (3 plus) for three weeks preceding labor. On the day of parturition she required 100 units of insulin; first day postpartum 90 units, 2nd day 50 units and 3rd day 30 units. Then followed five days when she was sugar-free on 30 to 40 units daily. The only known sugar-free period in twelve years! She was dismissed on the tenth day, taking 35 units of insulin.

This patient again became pregnant in 1942. After eight months' gestation she bore a 5 lb. dead fetus. During this pregnancy there was only mild toxemia (1 plus). She required approximately 30 per cent less than her average dosage of insulin on the day of labor and for two weeks postpartum.

To summarize: The first patient represents the potential or latent diabetic. Sugar in urine occasionally during pregnancy only. High blood sugar (200 mg.) found once five weeks before parturition. Blood sugar below normal a few days previous to and ten days following labor. The second patient represents the severe diabetic with most of the important features: high daily insulin requirement, frequent hypoglycemia, allergy, toxemia of pregnancy, neither pregnancy coming to term, highly variable insulin requirement during labor and during postpartum, one diabetic cousin.

Pregnancy with diabetes was not a serious problem a generation ago because, before the insulin era, the incidence of pregnancy was only 2 per cent in diabetic women. This 2 per cent had mild diabetes and generally aborted during the early months of pregnancy, thus liquidating the problem before it became serious. Modern management has greatly reduced the morbidity and mortality of the diabetic mothers. But a similar statement cannot be made concerning the babies borne by these mothers. Early this year, Miller, Hurwitz and Kuder made this statement: "In pregnancies complicated by diabetes mellitus, the fetal and neonatal mortality is about five times higher than in nondiabetic pregnancies. . . . About 30 per cent of all pregnancies complicated by diabetes mellitus result in the death of the fetus or the new-born infant. The cause of this high mortality has remained obscure. No significant reduction in fetal deaths has been shown to have occurred since insulin has come into use."

The manner in which the maternal organism may be affected by pregnancy is not predictable. Pregnancy in a previously normal woman may eventuate in a profound upset of this normal woman, as we all know. Diabetes, on the other hand, may cause widespread and bizarre derangement of the entire metabolic process in the non-pregnant subject. Therefore it should cause no great surprise that diabetes mellitus and pregnancy, in the same subject, present a playground for signs and symptoms

almost inconceivable in complexity and extent. For this reason, reports, up to the present, yield data which at times seems conflicting.

I shall now endeavor to summarize the status of this problem at the present time by listing what appear to be the important facts. I shall merely enumerate them as there is no logical order apparent.

1. The mother with known diabetes faces a mortality rate of 3.8 per cent, or six times as high as does the non-diabetic mother. Toxemia and eclampsia occur 50 times as frequently in the diabetic as in the non-diabetic mother.

2. About 30 per cent of all pregnancies in this category result in death of the fetus or the new-born.

3. Full-term babies from diabetic mothers average above normal size.

4. Congenital diabetes is rare.

5. However, development of diabetes later in life (child of diabetic mother) is not rare.

6. Diabetes is transmitted according to Mendel's Law as a recessive character. "The percentages of offspring (from diabetic mothers) who have diabetes varies in different reports by various authors, but it appears that probably 15 per cent will have either diabetes or vascular disease."

7. There is, as yet, no answer to the question, "Why do the babies die?"

8. Hypoglycemia is common in the new-born of diabetic mothers. But this is not accepted as the cause of the high infant death rate.

9. In fact, there seems to be a general agreement that in the last days of gestation, hyperglycemia in the mother is more dangerous to the infant than hypoglycemia.

10. It appears that there is a tendency to increasing hyperglycemia during the later weeks of pregnancy with a rather sudden decrease during parturition—a decrease which may persist for a week or more postpartum.

11. However, a relative hyperinsulinism may occur suddenly any time during gestation.

12. There is considerable disagreement as to the indications for cesarean section. Obviously, with a mother and father of some discernment, their desires and their willingness to assume risk must be considered.

13. Congenital defects occur about twice as frequently in the child born of a diabetic mother.

14. There seems to be no agreement as to necessity of routine administration of glucose to the new-born.

Now, for a moment, may we consider the question of glycosuria in pregnancy? When must we consider such glycosuria as being actually the result of diabetes? For years, we have all known that sugar appears occasionally in the urine of many pregnant women, whom we have adjudged not to have diabetes. We have probably, with good reason, ignored this glycosuria. As recently as 1939, Gonzales, Vallejos, and del Cerro, quoting Labbe, asserted that glycosuria occurs in about 80 per cent of all

pregnancies. They add: "It is easily diagnosed. Its mechanism is not known and its prognostic significance is nil. Diet has no influence on it and insulin has no effect and must not be used." Only a year before that, Sharkey stated that glycosuria occurs in 35 to 60 per cent of non-diabetic pregnant women. However more recently (1944) a group of workers on the eastern seaboard (already quoted), reported parturition in 137 mothers delivered in three different hospitals with conclusions that indicate that glycosuria during pregnancy must be given more careful scrutiny. These workers found that "the presence of glycosuria in the last months of pregnancy in women whose carbohydrate metabolism is otherwise apparently normal is associated with a fetal and neonatal mortality that is as high as that among offspring of women with definite diabetic signs and symptoms."

Reports up to the present time seem to justify the following conclusions:

1. The broad general principles for the management of pregnancy and of diabetes, as we have learned them independently, should continue to govern us when the two conditions present in the same patient.

2. Cesarean operation should be employed according to accepted obstetric indications.

3. The woman who aborts repeatedly should be studied for latent diabetes.

4. All glycosuria in pregnancy deserves more careful study than has been accorded it in past years.

5. The woman with clinical diabetes mellitus should be informed of the hazards of pregnancy and advised to avoid pregnancy. Pregnancy in the severe diabetic is nothing less than a catastrophe.

6. As more work is done on this problem—the diabetic mother and her child—we may learn of factors operating in diabetes of which we have not previously been aware.

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- *Recently Priscilla White of Boston has reported favorable results in the use of diethylstilbestrol during pregnancies complicated by diabetes and toxemia.

Dermatological Problems in a College with A. S. T. P. Students*

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DERMATOLOGICAL problems have had an important role in the activities of the University of Cincinnati Health Service. Visits to the Health Service are made without previous examination by a medical officer and cases are referred to dermatology upon the statement of complaint by the patient. Dermatology clinics are held twice a week and cases reporting between clinic days are usually saved for the skin clinic. The infirmary is located in the same building as the clinic and bed cases are thus readily hospitalized and observed by the dermatologist. Return visits are also made at the suggestion of the dermatologist. However, sick-leave is not permitted for skin ailments and visits have to be made on the patient's free time. Excuse from physical training, drill, and swimming are given with the signature of the physician. All patients have a card upon which is recorded their visits, diagnoses, treatments, excuse permissions, and progress notes.

STATISTICS

The following statistics were compiled on the basis of the six months period between August 1, 1943, and February 1, 1944, from the records kept at the University of Cincinnati Health Service. These statistics are probably unique for a college training school since the calibre of the men is higher than is encountered in a routine cross-section of army privates. Statistical differences with similar schools will most certainly be found and probably depend upon differences of particular circumstances such as environment, school activities, and special problems which are peculiar to the school.

No case of syphilis was reported.

During the months of August, September and October a record of the number of hospitalization days according to the causative diseases showed that dermatological conditions headed the list with 152 days. Vincent's angina, of which there had been an epidemic, was second with 90 days, and acute respiratory infections were next with 80 days. Of the 152 hospital days spent by skin diseases, 138 were due to trichophytosis and its complications with secondary pyogenic infection, cellulitis, and lymphadenitis. The other dermatological entities requiring hospitalization were dermatitis venenata 9 days, non-specific balanitis 3 days, and urticaria pigmentosa 2 days. The last was hospitalized for medical work-up and biopsy rather than for treatment.

A total of 814 different cases were seen with 26 separate entities. The frequency of the various skin diseases seen is listed as follows:

- | | |
|---|-----------|
| 1. Fungus infections, including complications | 562 (70%) |
| 2. Blisters — traumatic | 53 |
| 3. Folliculitis | 35 |

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4. Acne, all types	30
5. Warts, including plantar	25
6. Callosities	22
7. Impetigo	15
8. Dermatitis venenata, all causes	12
9. Pediculosis pubis	10
10. Miliaria rubra	9
11. Psoriasis	5
12. Hyperidrosis	5
13. Pityriasis rosea	5
14. Tinea versicolor	5
15. Pompholyx	4
16. Seborrhea	3
17. Erythema multiforme	3
18. Urticaria	2
19. Neurodermatitis	2
20. Sebaceous cyst	1
21. Follicular keratosis	1
22. Acne keloids	1
23. Keloid	1
24. Urticaria pigmentosa	1
25. Lichen rubra planus	1
26. Sycosis barbi	1
Total	814

These figures show marked discrepancies with those published by Woolhandler¹ concerning common skin diseases seen in an army station hospital. He found that only 14 per cent of 3,000 patients suffered from fungus infections. However, here also, fungus infections produced the highest incidence of all skin conditions even though the greater variety of entities seen in his series depressed the relative percentage of fungus diseases.

Tabulation of the total number of visits to the clinic in October for all causes again showed a predominance of dermatological cases. Five hundred thirty-four visits were recorded with diseases of the skin while its nearest competitor, Upper Respiratory Infections, stood at 305. Of the skin diseases seen, trichophytosis was first with 372 visits.

Our overwhelmingly major incidence of fungus infection constituted our greatest problem both in prevention and treatment. The diagnosis in all cases was made by clinical inspection. Mycological studies were not done, although this would have been a splendid opportunity for such studies had the time and facilities been available.

There were several factors aside from the natural great incidence of fungus infection which helped increase the frequency with which patients presented themselves for treatment of this disease. The first was the fact that the most frequent sites of involvement were the feet and crural areas, sites which seriously affected participation in the various activities of the student cadets. A second factor which perhaps artificially helped swell the number of trichophytosis cases was that special care was taken by officers of inspection to report fungus infections and to order the affected individuals to report for treatment. This was done as a preventive measure. A third possible

reason for the popularity of this affliction was the fact that "athlete's foot" is well advertised and is often self-diagnosed from frequently asymptomatic interdigital scaling. The cadets were instructed to report for treatment at the earliest signs or symptoms of the condition.

TREATMENT

Treatment was often influenced by the fact that the men were reluctant to lose study time or training; and hospitalization would mean a serious loss for them. For this reason many patients were allowed to be ambulatory, or restricted to quarters and classrooms when they might otherwise have been hospitalized. Self treatment was usually not allowed in the barracks.

The medications used were those staples with which the pharmacy is kept stocked. Although infrequently used medications could be ordered by prescription, we tried as a rule to utilize those kept in the pharmacy. It might be of interest to list our stock of staple medications, since they are few and have served very efficiently. They are listed in the order of frequency of use:

1. Castellani's Mixture
2. Whitfield's Ointment 50%
3. Petrolatum
4. Lotio Alba
5. Calomine Lotion
6. Tincture of Green Soap
7. Ammoniated Mercury 5%
8. Di and Trichloracetic Acid
9. Tincture Merthiolate
10. Aluminum Acetate Solution 5%
11. Ichthyol 5% in Zinc Oxide Ointment
12. Potassium Permanganate 5%
13. Gentian Violet 2% Aqueous
14. Bichloride of Mercury 1-1000
15. Merthiolate Ointment
16. Boric Acid Ointment
17. Resorcinol Compound Ointment
18. Cuprex

Our physical therapy equipment consists of an ultraviolet lamp of the carbon arc type, and an electrocoagulation unit. X-ray therapy cases are referred to the Cincinnati General Hospital. Because of the inconvenience and the expense involved, we have tried to keep down the number of such cases.

The largest part of our work was the treatment and prevention of fungus infections. I believe that the best preventive measure was that of inspection of all new arrivals, recording of all cases of infection, and institution of treatment in those cases. By this method we found that approximately 35 per cent of all arrivals had some infection of various degree of involvement. Inspection was repeated at the time of departure from the university and it was found that about 50 per cent of those previously infected showed no involvement and the remainder showed minimal involvement. During the trimester of November, December and January, the number of hospitalization cases due to fungus infections dropped considerably mainly, we believe, because of these preventive measures, although we do not have actual figures.

Our treatment of fungus infections closely followed that recently described by Stokes.² Trichophytosis of the feet complicated by superimposed pyogenic infection were hospitalized at bed rest. Continuous wet dressings of diluted aluminum acetate solution were applied. Sometimes wet dressings were left off at night and potassium

permanganate soaks 1-1000 were given before bed or gentian violet 2 per cent aqueous was applied. This regime was continued for from several days to several weeks, depending on the severity of the infection. Debridement of soggy infected, necrotic skin was done as necessary. Patients were not discharged until all signs of secondary infection were gone and the lesions were dry. At this time they were treated as ambulatory acute cases.

The ambulatory acute fungus infections constituted the bulk of the cases treated. These cases routinely were painted with Castellani's Mixture. To facilitate the treatment of large numbers of patients, the medication was kept in wide-mouthed bottles and painting was done with an actual paint brush, about one inch in width. Patients reported as often as the condition warranted, until all lesions were absent or the dry chronic stage had been reached. At this stage they received 50 per cent Whitfield's Ointment to be applied at night and were told to report weekly for observation until cured. Intractable cases received x-ray therapy.

Of the other dermatological entities only callusies and warts, acne vulgaris, impetigo and pompholyx offered any problems of interest for discussion. The differentiation between callus and plantar wart was often important since the former was usually referred to orthopedics and the latter was treated by us. Here the transillumination test described by Goldman³ was a helpful aid. Plantar warts all received superficial x-ray therapy with doses of 1000 r unfiltered, given once a month. Usually only one or two such treatments sufficed. Other warts were treated with dichloracetic acid, trichloracetic acid and electro-coagulation. Of the three, we preferred the last method because of the rapidity of treatment and certainty of cure. Dichloracetic acid seemed slightly superior to trichloracetic acid in our experience.

Acne cases received tincture of green soap and lotio alba with instructions to lather the face for three minutes twice daily followed by the application of the lotion. This treatment alone was sufficient to give relief in most cases. However, several cases required x-ray therapy, particularly one case of acne conglobata with severe involvement of the face and neck. Comedone extraction was performed as indicated. Five cases of acne were treated with vitamin A, 100,000 units daily, in conjunction with a study being made at the Cincinnati General Hospital. All of these cases had normal vitamin A levels and only one of them seemed to be improved by this method.

The treatment of impetigo brought up the question of the use of sulfathiazole ointment on the skin. During the past few years an increasing number of articles such as those by Glicklich,⁴ Weiner,⁵ Cole,⁶ and others, reported the frequency of sulfathiazole sensitivity produced by its topical application. Because of these opinions and our own experience, we went back to old-fashioned ammoniated mercury which is still an efficient medication. Sulfathiazole was reserved for intractable cases.

The few cases of pompholyx presented greater difficulties than the small number might indicate. These cases were all on the feet, were all secondarily infected, and were all diagnosed at first as complicated fungus disease. The infections were usually difficult to clean up,

and new vesicles and bullae cropped up under observation and also became infected. In these cases, bed rest, wet dressings for infected lesions, calomine lotion when the infection subsided, and x-ray therapy were all necessary before the condition was controlled. Disability was usually protracted, lasting several weeks to a month or more.

The only rare disease encountered was urticaria pigmentosa. The diagnosis was made from the history and clinical appearance of the lesions. A biopsy was done but the tell-tale mast cells were not found. The patient was presented to the Cincinnati Dermatological Society where the diagnosis of urticaria pigmentosa was generally agreed upon.

To summarize, we have described the administrative problems of the dermatologist at the University of Cincinnati health department; some statistics on incidence

of dermatological conditions were presented; we have discussed in some detail our efforts to combat fungus infections; and have noted some of the problems associated with other common dermatological entities.

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Higher Education in the Postwar Era*

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INTRODUCTORY

IT gives me great pleasure, in behalf of the city of Cincinnati and of the University of Cincinnati, to welcome you for your sessions here. You will find on all sides, I believe, the hospitality of a community often termed a northern city with a southern exposure. Cincinnati is really a fascinating place, which retains, along with its industrial and business strength, the flavor and culture of its old-world origins and of the colorful past of steam-boat days.

Your academic host, the University of Cincinnati, has two founding dates: one for Cincinnati College in 1819, and the other for its establishment in 1870 as a municipal university. It has ten component colleges, including the Graduate School of Arts and Sciences, College of Liberal Arts, College of Engineering and Commerce (where the co-operative system was begun by the late Dean Herman Schneider in 1906), Teachers College, College of Home Economics, School of Applied Arts, School of Nursing and Health, Evening College, and two historic professional departments: the College of Medicine, chartered in 1819, and the College of Law, established in 1833. In peace times there were 4,300 full-time students and a grand total enrollment of over 10,000 students.

THE ORDEAL WHICH LIES AHEAD

My address to you today will not relate to the trials we of the colleges and universities of America have been undergoing in connection with Army and Navy contracts. You of the student health services are abundantly aware of these.

A new situation has arisen in consequence of the War

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Department action of mid-February drastically curtailing the army specialized training program, following as it did an earlier reduction in the Army Air Force collegiate program. The ordeal of too much work is suddenly past. Another ordeal faces our institutions: lack of enough work to keep our staffs and facilities fully occupied. All colleges and universities—excepting the colleges for women—are thereby in financial peril.

The topic which I am to discuss assumes that our institutions of higher education will persist; that they will survive to face new problems in the era of peace.

I shall not deal with future problems as they relate to student health, except to say that, in my opinion, your province will be larger and more important than ever. The war has revealed a new potency in health as a resource for defense and offense. I believe colleges and universities will begin the era of peace determined to fulfill the Greek motto about the sound mind in a sound body.

Since you are all broadly concerned with educational policies, I shall present my ideas as to these policies for the periods to come: the immediate postwar period and the longer period of peace.

IMMEDIATELY AFTER THE WAR

Dominant in the immediate postwar period will be the returned veterans of the armed services. These veterans, some women and a host of men, will present problems both as to magnitude and complexity which will challenge the intelligence and resourcefulness of every college and university. Burdens quite as heavy as those assumed with patriotic cheerfulness during war time will have to be sustained for several years at least when peace comes; and I am convinced that teachers and administrators will meet them with continued good will.

Why do I speak so assuredly about the magnitude of the student veteran problem in respect to numbers?

(1) Because it will be financially feasible for veterans to return to or to enter school and college. There are four bills before the House and Senate which differ as to administrative authority and various other details, but are alike in providing federal funds to enable returning men and also women of the armed forces to take from one to four years of additional education at approved schools, colleges and universities.

(2) Because of the interest in education which we find to exist among soldiers. I would cite a survey here at the University of Cincinnati showing that eight out of ten soldier students of the ASTP expressed a desire to return to this campus or some other to complete their college courses. This was a special group and does not therefore form a basis for generalization as to ratios. But it shows the trend. A logical basis for generalization is to be found in more general academic training of young men in the armed forces in this war as compared with World war I, when far fewer had attended high school. There is further evidence in the popularity of correspondence courses and other work of the Armed Forces Institute.

One qualification must be stipulated. If the war lasts long, these young fellows will feel old and won't want to return to school or college. The novelist and Ohio farmer, Louis Bromfield, commented on this aspect of quick maturing. Soldiers home from the South Pacific or from North Africa and Italy and sailors from the seven seas already show a difference. "There is something quiet about them. They have a dignity which no kids of that age ever have who have not looked upon death."

These youths who already have in their eyes "a steady clear almost sad light of maturity," are going to approach their college work far differently from carefree campus students of the past. It behooves us as teachers and administrators to get ready for them in ways different from the perfunctory patterns of the past. This will take more than a resumption of the "normalcy" curricula; more than a revamping of old lecture notes that should be gone with "the snows of yesteryear."

Here is a grand chance, it seems to me, to put new life and planning into all we do on the college campus.

We must be on guard, however. This will prove a heyday for the educational crackpots, those who insist that everything we have done is wrong and that their particular plan or program is the panacea.

The ideal will, I think, remain the Greek one; nothing in excess. It was expressed in the preface to the *American Book of Common Prayer* as "the happy mean between too much stiffness in refusing and too much easiness in admitting variations in things once advisedly established."

SEVERAL SPECIFIC POINTS

Returned soldiers and sailors will inevitably form the overwhelmingly preponderant enrollment in the professional colleges of law and of medicine and likewise in the graduate schools of arts and sciences. Accordingly fac-

ulties will need to adapt their material and methods to satisfy these students.

Every college of undergraduate status, both independent and in universities, will similarly have a considerable proportion of veterans; and there will be problems of how to handle them along with younger, immature girls and boys coming up direct from the high schools. My judgment is that liberal arts colleges should give consideration to using, for older thoughtful students, the method of seminars, of individual reading, of general examinations which have been developed in certain American colleges and universities during the past twenty years. I refer to the Harvard, Princeton, Swarthmore and Smith College procedures. Here at the University of Cincinnati, our College of Liberal Arts has for about a decade utilized an adaptation of these eastern methods which I regard as sound and successful.

General awareness of the problems to be faced is evidenced in appointment at colleges and universities for study and planning for the postwar era. (President Walters cited the statement of a typical study, that of University of Cincinnati).

THE LONG LOOK AHEAD

In the longer period of peace to succeed the immediate postwar years, there will arise problems now apparent and others not yet discernible.

My enrollment studies over the past quarter of a century convince me that American colleges and universities will run up against decreasing numbers in the next half dozen years. The population statistics are clear on this point. They may be offset to some extent by making it possible for more of the fewer existent boys and girls to attend college by means of state subsidies or larger scholarship provisions. But I would repeat a warning I have frequently given to presidents of small colleges to beware of over-expansions of dormitory and other facilities. I risk being called a masculine Cassandra by so doing; but remember, Cassandra was right.

As to the continued and deepened usefulness of higher education in American life of the peaceful future I have no doubt.

On the side of science, our colleges and universities will provide research which will go on to findings as yet unimagined. Our technological colleges will utilize these findings to implement industry and business so that an era of amazing conveniences and creative comforts will follow.

That these conveniences and comforts may become nationwide and ultimately worldwide will be, I believe, the contribution that economics, law, business, and other social sciences can and will make to mankind.

But America must be more than a well-fed, well-dressed nation, if it is to fulfill its historical destiny. Our collegiate program of liberal arts must rise to the heights by feeding the hunger which the human spirit feels for the dignity and beauty of the humanities and of religion.

All this imposes tasks of enormous difficulty. But the tasks are fascinating and to seek attainment remains a quest which makes higher education the most thrilling of all endeavors.

Anesthetic Aspiration Asphyxia as a Cause of Maternal Mortality and Morbidity

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IN a recent study of maternal deaths published by the Maternal Mortality Committee of the Minnesota State Medical Society, it was found that of 112 maternal deaths over a period of one year in the state of Minnesota, three cases were ascribable to the administration of obstetrical anesthesia. These deaths and the fact that the writer of the present study has had two personal cases, one of death and one of recovery, due to anesthetic aspiration asphyxia, has resulted in this report, in an effort, if possible, to obviate the future occurrence of this most distressing accident. It is, of course, obvious that aspiration of vomitus or secretions during the course of an anesthetic is not limited to obstetrical patients alone, but can occur whenever an anesthetic is administered for any purpose, so that any technical remedies recommended to prevent aspiration and to safeguard patients will be applicable whenever an anesthetic is required.

It is of interest at this point to note that in reviewing the literature, reports of instances of aspiration during or after anesthesia are extremely few, and this despite the fact that such aspiration is recognized as a definite anesthetic hazard.

One of the earliest references to aspiration of stomach content as a cause of bronchopneumonia is the report of Woillez in 1872, who described this form of bronchopneumonia in relation to postoperative complications and to gastric diseases. Becker, in 1887, refers to the same condition. Balfour and Gray, in discussing postoperative complications, have also called attention to the danger of aspiration of stomach contents. Waters and Harris, in a paper discussing the factors that influence the safety of pain relief in labor, state, "the ease with which vomitus may be aspirated is not generally recognized."

Hall, in an article entitled "Aspiration Pneumonitis, An Obstetrical Hazard" states that of a series of 15 cases of aspiration pneumonitis, 5 resulted in death; 14 of the women concerned were obstetrical patients. His study of these cases revealed no one factor present in enough instances to make it seem a predisposing cause. The series of cases reported by Hall were collected merely by making inquiries among his circle of medical acquaintances. Twelve of the fifteen cases occurred within a period of two years. He states further that "a careful search of all the medical literature failed to yield a single detailed report of a similar case." The textbooks on anesthesia, as well as numerous articles mention it as a possibility, but no case reports could be found.

Waters feels that by prompt and judicious application of technical remedies the instant the need for them

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arises, the physician ought to prevent both asphyxia and aspiration pneumonitis.

Spaid, in commenting on the report of Hall, states, "In my experience as an anesthetist, by far the greatest number of complications from aspiration have occurred in obstetric patients. Frequently these patients have gone into labor after a full meal, but many times they have been given food while in active labor. It cannot be urged too strongly that women in labor be denied food and so-called sustaining drinks. If nourishment is imperative, dextrose may be given intravenously. I can easily recall at least a dozen complications of this nature with obstetric patients ranging from mild to extremely severe, fortunately with no fatalities."

Guedel states that too much emphasis cannot be placed upon the danger of aspiration of vomitus, during the course of an anesthetic, and that this has probably been encountered more frequently by anesthetists than any other serious accident.

Reflex vomiting, which is the offending type, occurs in anesthesia at the junction of the second and third stages, either upon induction or emergence. Its prevention during induction depends upon carrying the anesthesia rapidly through the second stage and well into the third stage since any retardation of the anesthetic at this time will frequently result in vomiting.

Accident cases and women in labor, when brought to the hospital as emergencies, are the worst offenders. Unless there is positive evidence that no food has been taken within the past eight hours their stomachs must be assumed to be full. This period of eight hours is entirely arbitrary since all stomachs will not have emptied themselves within that period.

Washing the stomach before starting the anesthesia may be advisable where there is a history of recent food. This is not always practical and is not always efficient in emptying the stomach.

A report by the Committee on Maternal Mortality of the New England Medical Society states that ten maternal deaths due to anesthesia occurred in Massachusetts during 1941. At least seven of these deaths were due to the aspiration of vomitus. There is no mention made in this study of the total number of maternal deaths for the year. Embree repeats one case of aspiration pneumonitis following obstetrical anesthesia. No details are given.

Of the two personal cases to be reported, the first resulted in almost immediate death and the second in aspiration pneumonia with recovery.

Case 1. A white 27-year-old gravida II, whose expected date of confinement was December 19. Her general physical examination at the time of her first prenatal visit was negative. Blood pressure and urine examinations, Wassermann and smears were negative, measurements were adequate, and there was no

evidence of any pelvic obstruction. The history of her previous pregnancy was normal with delivery of a male infant after an eighteen hour labor.

On November 1, preceding the patient's expected date of confinement, she had an episode of painless uterine bleeding, small in amount. This was repeated about four days later and the patient was sent into the hospital for observation and diagnosis. At that time, a soft tissue x-ray plate was taken which showed no evidence of placenta previa. A sterile vaginal examination was made and the cervix was found to be long, rather firm, and the external os closed. The patient was discharged from the hospital after examination and had no further difficulty until the day of admission, November 20. At that time she complained of loss of fluid and of having uterine cramps. She was seen about 11 P.M., on November 20. At this time the fetal head was found to be engaged in O.L.A. position. The fetal heart tones were strong and regular and the patient was having rather irregular uterine contractions about every fifteen minutes. Rectal examination revealed the cervix to be about 50 per cent effaced and 1 centimeter dilated. Cervix just admitting the tip of the finger, head at a station minus 2. There was no abnormal bleeding at this time and no evidence of any placenta in the cervical canal. Patient continued in labor with pains becoming more severe and cervix dilating rapidly. Patient was again seen about 1:15 A.M. on November 21. At this time patient was already on the delivery table and receiving nitrous oxide analgesia. Shortly after starting the anesthetic, patient vomited a profuse amount of stomach content and at the same time apparently aspirated a large amount of vomitus, respiratory difficulty and development of cyanosis becoming acute at once. The head was lowered and a tracheal tube was immediately inserted and suction started, artificial respiration was begun at once and stimulants given. There was great difficulty in aspirating the contents of the bronchi because of the large amount and its thick tenacious character, necessitating the removal and washing of the tube a number of times as it became plugged. Further during this procedure, large amounts of the aspirated stomach content were forced out of the lungs by the artificial respiration. Heart sounds could not be heard after about 15 minutes, but artificial respiration was continued for about 60 minutes. All efforts to re-establish respiration failed. It was noted that following the aspiration of vomitus, patient made no effort to cough, probably due to the fact that the main bronchi were completely plugged. This patient had taken no solid food for eight hours previous to delivery.

In an effort to deliver a live baby, a low forceps extraction was done at the onset of the respiratory difficulty, and a living female infant rapidly delivered.

Case 2. Present history, past history, and prenatal course unrelated to cause of morbidity. Had taken buttermilk shortly before onset of labor. This gravida II was delivered by an easy low forceps after a relatively short labor, ether being used as the anesthetic. Vomited during the course of the delivery and aspirated. Immediately became cyanotic and respiration ceased. Suction used for aspiration and artificial respiration applied for several minutes until patient recovered. Blood loss continued during this time for a total of about 700 cc. and patient was given intravenous glucose. Following delivery patient had very labored and noisy breathing. X-ray taken within twenty-four hours showed "a mottled shadow in the lower portion of the left lung and to a lesser extent the right." Films repeated two days later showed "a definite increased density in the left midlung which could represent either a small area of atelectasis or possibly an infarct, atelectasis being more probable since the heart and mediastinum are shifted to the left. Films repeated again one week later showed "a resolution of the pneumonia previously reported. The right lung is relatively clear. There remain a few scattered areas in the left lung." Patient ran a temperature to 100.6° for about six days postpartum, after which it became normal.

Twelve hours after delivery, patient was bronchoscopyed and "the trachea was found filled with a creamy white liquid material which was aspirated. The mucous membrane was red and edematous. No food particles were noted in either bronchus."

Laboratory work showed a hemoglobin low of 51 per cent with 2,860,000 red blood cells, leucocytes ranged from 14,300

to 15,600. Sputum cultures taken on several occasions showed staphylococci and gram-positive cocci in short chains. Patient was given 300,000 units of penicillin starting with a 50,000-unit dose on day following delivery. Recovery was fairly rapid and patient was discharged from hospital on fourteenth post-partum day.

DISCUSSION

From a study of the textbooks and literature of anesthesia, it is obvious that vomiting during the administration of an anesthetic represents a danger which is far more serious than is usually regarded. It represents particularly a threat to the integrity of the bronchopulmonic tree, the real danger being the aspiration of a part of the regurgitated material into the finer distributions of the bronchial tree with the development of an aspiration pneumonitis, or of a massive atelectasis and sudden death. In addition, lesions of the bronchial mucosa may be produced by the direct irritating action of aspirated hydrochloric acid.

There are two types of respiratory complications to be feared during the administration of an anesthetic, i.e., those due to mechanical causes and those of a toxic or paralytic nature. Those accidents due to mechanical causes such as a partial or total obstruction of some part of the respiratory channel occur usually during the induction-period, since vomiting or regurgitation is relatively frequent during this time. The treatment called for is wiping of the retropharyngeal space with gauze wrapped upon the finger and aspiration by the use of suction.

Obstruction of the retropharynx may also be produced by the accumulation of bronchial and salivary secretion. A peculiar rattle with each act of respiration will be noticed while from the nose and mouth is emitted an abundance of foamy fluid. This disturbance is particularly noticeable in individuals in whom the irritating action of some of the anesthetics tends to induce a hypersecretion of the trachea and salivary glands. This condition can be avoided by the administration of atropine which will reduce and even completely suppress the secretion of the mucus and saliva.

Accidents of a toxic and paralytic nature are more to be feared than those due to mechanical causes, but do not concern us in this discussion.

It must be remembered that vomiting is also frequent during the period of awakening. The patient brings up an abundance of bile, gastric juice, saliva, and tracheopharyngeal secretion, with periodic swallowing. The occurrence of vomiting at this time makes it necessary to continue watching the patient closely to prevent aspiration. To protect the patient against this danger, it is necessary to clean out the mouth and pharynx rapidly and with great care; the head should be lowered by raising the foot-end of the bed, and a mouth-opener should be used to render the oral cavity more accessible to suction.

It is especially in those patients who have been excited during the period of induction, and had a stage of surgical anesthesia difficult to maintain, that spasms on awakening which produce vomiting should be expected. Repair of episiotomies, or any other pain-producing pro-

cedures should not be started until the anesthetist states that the patient is already under surgical anesthesia.

Vomiting which follows a long period of retching during which the breath is held, is particularly dangerous. Here aspiration may occur in spite of the fact that the anesthetist is waiting with the mask removed for the vomitus to appear so that it can be properly taken care of. During vomiting, the masseter muscles are likely to be so rigidly contracted that the mouth cannot be opened. The vomitus fills the pharynx and is drawn into the trachea and lungs mostly by the first deep post-retching inspiration. Under these circumstances there is nothing to be done until the masseteric spasm has passed and the mouth can be opened. It may then be too late.

Protection against aspiration of vomitus is best provided by preventing vomiting during both induction and maintenance of anesthesia, by carrying the anesthesia rapidly to below the vomiting area and holding it there. In the vomiting of emergence from anesthesia, we can do no more than be on the alert for it and be prepared to turn the patient so as to favor the drainage of the vomited material from the mouth. Dr. Ralph Knight, Professor of Anesthesia at the University of Minnesota, in a personal communication makes an important point here, i. e., all patients following anesthesia should be turned on the side and should have the foot of the bed elevated; both procedures tending to reduce the incidence of aspiration in cases having vomiting on emergence from anesthesia.

Another factor of importance has to do with the increased metabolic rate and the increased nervous irritability of pregnant patients. As a result of this, there is hyperactivity of the mucous glands in the respiratory tract and the patient may be filled with mucus early during the course of anesthesia, which will interfere to some extent with the anesthetic control. Suction and atropine will help to control this condition.

From aspiration of small amounts of semi-liquid vomitus there may arise at the time some respiratory difficulty accompanied by mild cyanosis. In this the immediate danger of asphyxia is small but such aspiration is often followed by multiple atelectases with grave post-operative morbidity or a fatal issue.

Vomiting is by no means always a vigorous activity. The vomiting of a small amount of fluid or semi-fluid and its almost complete aspiration may occur without the anesthetist being aware that it has happened. The mechanism of development of pneumonitis in these cases is probably the occlusion of the bronchioles by the aspirated material with atelectases immediately following, and infection beginning in the atelectatic areas. Prevention of this pneumonitis lies in the vigorous activation of respiration with CO₂ immediately after the anesthetic is finished and frequently thereafter for two or three days if necessary.

Massive atelectasis is the collapse of a large area of lung tissue. It may involve any amount of lung area from a part of a lobe to an entire lung or there may be involvement of large areas in both lungs. The mech-

anism which is most usual is the occlusion of a large bronchial stem.

Massive collapse during a surgical anesthesia may not be noticed until after it is complete. Even then, with closed ether or cyclopropane anesthesia where the oxygen tension of the anesthetic mixtures may be high enough to prevent cyanosis, it may not be noticed until after the anesthesia is discontinued and the patient is again put back upon the normal atmospheric oxygen tension. In such a case, cyanosis and labored breathing will appear within a minute or so after the discontinuance of the high oxygen atmosphere. Unless the oxygen is immediately reapplied the patient may die of anoxia within a few minutes. At this time a diagnosis could be made by listening to the breath sounds through the thorax.

Depending upon the amount of lung area involved, death may occur within a few minutes or within a few hours or complete recovery may be brought about in the same length of time. If the collapse is insufficient in itself to result fatally within a few hours, a consequent pneumonitis will probably develop which may be fatal within a few days.

Prevention of massive atelectasis depends upon prevention of bronchial occlusion. If the respiration is much depressed, a short period of CO₂ hyperpnoea at intervals of fifteen minutes or so is advisable. The prevention of postanesthetic atelectasis depends upon an active respiration. If this is present without the CO₂ this gas need not be applied although, properly used, it can do no harm.

RECOMMENDATIONS

From a study of the cases reported and a rather detailed review of the literature available on the subject under discussion, the following recommendations are made.

1. Diet control—women in labor should be fed no solid food. Fluids may be taken in moderation. If necessary, intravenous glucose may be used to supply energy and fluids. In patients who have recently eaten a large meal stomach lavage may be done if practical, or the patient should be delivered under local anesthesia.

2. Adequate obstetrical anesthesia equipment, including apparatus for aspiration and suction should be available at all times in the delivery room.

3. Correct administration of the anesthetic by a trained anesthetist to prevent vomiting, and especially to prevent aspiration into the respiratory passages of material from the back of the mouth is indicated whenever found. There is no question of the efficacy of the Trendelenburg position and of prompt cleaning out of the mouth and pharynx by aspiration and gauze. Inhalation anesthesia should be discontinued if patient has emesis and aspiration.

4. Bronchoscopy should be performed on all patients who have aspirated foreign material into the lungs, and the sooner this is done the better for the patient.

5. In patients who have subacute and chronic inflammation of the respiratory tract, it is best to avoid inhalation anesthesia and the use of strong preanesthetic medications, which are apt to depress respiration.

6. Avoid as much as possible long periods of apnea and cyanosis, which cause disturbances in the circulatory system and excessive secretion in the bronchopulmonic passages.

7. Stimulation of the respiration by the administration of carbon dioxide is indicated in those patients who have a depressed respiration, and in all cases with signs of bronchial embarrassment and difficulty in expectoration.

8. The patient should be persuaded, during the awakening period, of the necessity of deep inspiration every half hour, at the same time expectorating the accumulation of mucus as rapidly as it is formed. Patients must be persuaded that it is dangerous to remain immobile and to refrain from deep breathing.

9. Further active treatment of pulmonary complications should include the postanesthetic administration of carbon dioxide inhalations at the first signs of bronchial obstruction due to accumulation of exudate, and whenever there is the possibility of pulmonary atelectasis. Cardiac stimulants, inhalation of oxygen, antipneumococci vaccine, and penicillin should be used when indicated.

In cases of massive atelectasis, it is advisable to have repeated bronchoscopic aspirations of the occluded bronchi and the removal of any plugs occluding the bronchi. Portable x-rays will aid in indicating when this should be done.

10. Artificial respiration is the most effective method we have at our disposal to resuscitate a patient in apnea, and must be given promptly at the first signs of respiratory insufficiency without waiting for complete arrest of respiratory movements. The earlier and more efficiently it is used, the better will be the results. It is important to remember, however, that if artificial respiration is used before the air passages are cleared, aspiration of material into the lungs is encouraged. Tracheotomy is useful in those cases of asphyxia in which the mechanical obstruction is such that it cannot be overcome by the more common external maneuvers. It carries the possibility of success only if the obstruction is at or above the

trachea and such a condition is rare. We can reduce the indication for such an operation to cases of tumors of the neck, as a rule extratracheal but rarely intra-tracheal; and in such cases one will occasionally find an abrupt occlusion of the trachea. Exceptional indications may exist in cases of acute edema of the glottis due to infection of the floor of the mouth and the pharynx. Tracheotomy represents the only means of saving the lives of these patients and must be promptly performed. In some unusual cases where there has been secondary aspiration into the trachea of vomited material that cannot be removed by any other method, tracheotomy may be indicated.

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New knowledge as to the effective use of chest x-rays and new methods greatly reducing the cost of large numbers of x-ray diagnoses put into our hands far more effective facilities than we have heretofore had for the elimination of tuberculosis. It is now practicable to think in terms of x-raying the entire population of various areas, beginning perhaps with areas in which tuberculosis rates are still high. We can get rather definite estimates as to the number of cases which will be discovered in the various stages of the disease. We can formulate tentative estimates as to the additional number of hospital beds that will be required, and as to the numbers for whom partial or complete rest at home may be adequate. We can also judge as to the frequency with which such x-ray examinations will need to be repeated in any given locality, in order to catch the most recent infection.—(Homer Folks, *Amer. Jour. P. H.*, February, 1944.)

Vision Problems of Military Students with Heavy Academic Loads

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AT LEAST every individual in society has one eye problem and many have a number of different problems. In many instances the analysis is simple and again it is complicated and important, but simple problems under special circumstances become significant.

The vicissitudes of one's life change the appraisal of a given difficulty with the eyes. If the eyes are used to small degree, many minor conditions can be neglected without serious effect, but when the eyes are used extensively at close range for many years and many hours a day, our management of these conditions should become critical and fastidious. The class of persons with whom we are particularly concerned today is the advanced student. Modern education calls for continuous intensive application of the eyes for long periods—frequently to the thirtieth year and beyond.

It is difficult scientifically to determine how much harm is done to a relatively normal eye from excessive strain but the evidence is sufficient to state that, in general, our present management of the eyes of the advanced student is decidedly inadequate. Since the eye is an instrument that is almost indispensable in the attainment of knowledge, we can afford to make certain that the organ is in the best possible condition to function. At present, this is not the prevailing status.

Throughout medical experience, we are bound to the concept that if an organ is comfortable, our special attention is not necessary. Fortunately, the principle of inspection is gaining ground rapidly but we have much farther to go in this direction. The function of an eye is largely open to our investigation and analysis. The ordinary determination of vision in the usual inspection is shot through with serious error. It is true, test of the vision at distance uncovers a certain percentage of cases that obviously do not have standard vision, and a careful test of the accommodation with the Prince rule or similar device, discloses faults in the accommodation in some instances, but even with these precautions, a large number of problems are overlooked. The reason for this error is that many times especially when the degree of astigmatism is low, the patient has so much reserve accommodation that we are completely misled.

The time to deal with the eyes is before the student launches upon the most critical use of his eye perhaps of his life. The day will probably come when cycloplegia is used routinely before the student begins his heavy study.

This procedure would put our efforts on a more or less scientific basis. Not only is this available for the purpose of obtaining better results in education but we should have in mind the conditions of the eyes in later years when pathology begins to assume important proportions.

The span of life at present is about 68 years. This signifies that large numbers of persons exceed this age and the ophthalmologist is put to it to assure vision to these individuals because the eye deteriorates rapidly after the 63rd year. In the long lived group the ciliary mechanism with the lens often gives out long before the body.

At the time these patients present themselves for attention, most of the possibilities to bring aid have been lost. These facts suggest that a great opportunity exists in the twenties to decrease blindness in the declining years when reading is one of the few satisfactory experiences remaining to the individual.

Recently I have seen a number of professors in the university whose vision is failing prematurely. In each of these instances there was poor prophylaxis. Indeed, I would go even farther and state that where a parent wishes to see to it that a student is not handicapped, it would be wise to have cycloplegia used at the age of ten years for purpose of analysis and record. All that can be said of school inspection of the eyes—as ordinarily practiced—is that it is better than nothing.

Stereoscopic equipment is being used here and there and this is a distinct advance but even this procedure is not completely satisfactory.

The Army standards for the various services has brought into relief the present primitive standards for eye efficiency. Parents are shocked to learn that their children are not eligible for the Navy or the Air Services. Demand for stereopsis is a great surprise to the young man who never realized that he possessed a deficiency for naval service.

The propaganda of companies who sell stereopsis devices, calls attention of factory heads and school authorities to the more refined lacks of the visual apparatus.

Teachers in sight-saving classes are beginning to use stereopsis charts. Recently one of the teachers referred a patient and noted that in spite of the satisfactory results of her stereopsis test, she still felt that the boy needed an eye examination.

Cycloplegia revealed the not surprising fact that a considerable error of refraction with astigmatism was present.

In recent years the psychologists, such as Dr. Renshaw, have made a definite contribution in the field of visual education. Great possibilities apparently exist in this field but the intensive attention called for highlights the importance of having the visual organ at maximum power if these instructional processes are not to increase the heavy strain on the eye which already exists.

At the age of ten years, the eye is endowed with 14 units of focusing power. Since 3 units are required to focus at 33 cm., this leaves a reserve of 11 units of focusing power. By 21, the accommodation is reduced

to 10 units with a reserve of 7 units. The maintenance of continued focusing over many hours of continuous study has the same effect as 3 units of error at a distance which usually gives definite symptoms. When the ciliary muscle acts, the choroid moves forward and the lens thickens and narrows, the effect being greater in the center anteriorly with no effect on the posterior surface. The constant play of the ciliary muscle favors spasm and congestion of the ciliary mechanism.

Especially in the presence of chronic infections, this congestion is increased, and a number of unfavorable conditions develop. This is particularly true when the mechanism has to contend with various degrees of astigmatism, which is present in the large majority of cases. Thus, when a large refraction error is present for distance, the stress on the eye is multiplied. At times the ciliary muscle develops chronic spasm which further aggravates the situation. At other times the muscle develops an exhaustion.

When students are under heavy pressure in their studies it is occasionally advisable to give a special glass for study in addition to the distance correction. Often this tends to neutralize partially the abnormal conditions which prevail during intensive study.

In our series of cases there were a number who benefited by a special glass for close application.

In our discussion it is understood that the suggestions made apply to those who use their eyes incidentally. An entirely different system of management should be used when application of the eye is extreme as with the serious students of our university group as well as comptometer operators, inspectors of small parts, telephone operators, etc. One's standards should be exceedingly critical. The question arises seriously whether the visual organ is constructed to withstand without damage the stresses to which it is subjected by the constantly increasing needs of modern technology and educational practices.

Often these students complain of inability to do sustained study without discomfort. Headache and eye pain of various degree are quite common, extreme fatigue of the eyes, temporary dimness of vision, undue sleepiness, burning of the eyes, photophobia are mentioned. On the other hand, a considerable group need attention badly who have very few symptoms or are unable to voice their symptoms. One is often amazed to discover conditions of the utmost importance in young people who apparently have few, if any, symptoms.

This absence of symptoms is so common that the habit of feeling that abnormal physiology will manifest itself to the patient is not tenable. In fact, if we wish to be thorough, one is forced to suggest that every university student should be subjected to cycloplegia and refraction before undertaking serious study. This counsel may seem extreme but it is amply sustained by the evidence and in years to come will be a commonplace.

When we refer to eye strain we really refer to the activity of the ciliary mechanism. This mechanism admittedly has a remarkable reserve but under the volitional drive of the ambitious close worker, the ciliary body can easily be forced beyond its physiological limits. Incipient

pathological changes in this mechanism occur rather readily and lay the groundwork for future catastrophe.

With such considerations in mind, this writer welcomed the opportunity to make a series of studies of the eyes of 182 students of the Ohio State University Student Health Service of which Dr. J. W. Wilce is the head.

This group of young men were of an average age of twenty-one years. Their eyes were uniformly subjected to intensive, perhaps excessive use and one was presented with almost an experimental set-up to see how eyes behaved under hard use. One could study these eyes with reference also to the attention that had been devoted to them in the period previous to this twenty-one year level.

The purpose of these examinations was to aid young men in mastering their subjects at the university for war purposes—as in engineering, foreign language study, medicine, etc.

It is obvious that if pain in the eye, excessive fatigue, headache, sleepiness occur, in a short time the student is unduly hampered in mastering his studies.

The men were all examined under cycloplegia, (homatropine 4 per cent) four instillations at 15-minute intervals with an additional interval of about forty minutes.

Of this number (90 had myopia) 126 of them needed attention definitely while in 60 cases the need for service was relatively incidental. Of the 126 that required positive help, 66 had features of special interest and were important. Of the 60 cases that were relatively unimportant, 16 had little significance to our purpose.

The group of students studied come from unusual families and have had exceptional opportunities. They have studied at other universities in many parts of this country. A considerable proportion have had excellent care by efficient ophthalmologists but this was not the rule.

I shall try to give you information in a rather detailed manner of the findings in this selected number.

Since it would be impractical to give a detailed report on these 66 cases, a number of headings were selected and a tabulation was made of the number of times a particular feature recurred in the series. A surprising development was the apparent relation of infection to eye discomfort. Scarlet fever, pneumonia, various degrees of sinus disease, influenza, tuberculosis and appendicitis were noted. There were 19 under this heading, the largest single list.

This, of course, raises the question as to what part these infections have played in producing the eye symptoms related by the patients. When a definite eye condition is associated with these infections, the problem becomes complicated. However, it is possible to state that these infections apparently were definitely related to symptoms in a large number of these cases. This experience suggested that there should be a closer relationship between the oculists' work and other fields than usually prevails. Especially is this true of the sinologist.

Fifteen mentioned headache of various degrees of intensity and frequency. This is a lesser number than one

might expect and shows that when there is definite abnormality of the eyes, headache does not occur as often as one would expect in this age group.

Blurring vision was an important finding. Along with this symptom was classified, inability to study except for a short period of time. It was common for the student to state that he could only proceed with study for an hour or so because of discomfort or that he became abnormally sleepy all factors considered. This condition occurred sixteen times and gives us a limited glimpse into the results that various students derive from their study. It is true that many students disregard their discomfort and continue with their studies but if they are successful in this regard, the end result is injurious to the eye and to the organism as a whole so that little is gained in the end.

Burning, scratching and aching eyes were included under one heading. Of these there were eighteen. Little need be said except to note that these symptoms certainly impair the efficiency of the prospective student.

Conjunctival involvement was listed in eight cases. This occurred from various causes often associated with sinus infection. Weak focusing power was established in eight. In several cases one discovers that the refraction error is not great and does not seem to account for the symptoms described. This in itself is a large subject but under certain conditions, the ciliary mechanism becomes exhausted especially in the student who is studying far beyond physiological limits.

This is often associated with low grade infections which as demonstrated, were so common in this group. Here frequently a special stronger glass for study is a real boon to the hard pressed student. The faculty members certainly have a responsibility in this condition. Assignment of abnormal requirements by individual instructors who at the same time do not know the demands being made by their colleagues may easily play a part here. Of course, there is no way to deter a certain type of eager student. At any rate, we have here a hint that the eye is giving way under stress and laying the foundation for future eye pathology.

Gross inaccuracy of refraction—sixteen. Here I do not take account (though we really should) of the relatively small variation from accuracy in refraction. These sixteen instances of poor refraction were definite and important and impeded the efficiency of the eyes. Much could be written concerning this inexcusable condition. Suffice to state that cycloplegia is not reliable in many cases of ciliary spasm, and that even granting perfect cycloplegia, refraction, as DeSchweinitz often emphasized, is an art and is difficult to master.

Definite need but never have had glasses. Of these, there were eight. These students are twenty-one years of age and should have had glasses to study for many years. This is one of the reasons we should have cycloplegia in all children at 10 years of age.

Hyperopia of high degree—seven. Arbitrarily I chose

cases with over 2.5 diopters of hyperopia. None of these young men had their full correction which is essential to the best results from every point of view.

Progressive myopia—four. This condition is seldom very active after twenty-one years but when it is present at this age, it usually shows actively abnormal condition of use of the eye or in the general condition of the patient. You recall that of the 182 cases in the entire group studied, there were 90 with myopia. Since the occurrence of myopia is about one in six of the population, it is interesting that one in two of these young men especially chosen for advanced study have this condition. An analysis of this problem would be beyond the scope of this paper but we do know that, on the whole, the myope is a better student than the definite hyperope, especially when not critically corrected for study. This raises many interesting questions.

Shallow anterior chambers—three. This is the type of eye that later in life develops glaucoma and suggests where we have to start if the management and prevention of this disease is to be successful.

Muscle abnormalities—ten. These are not just slight imbalances but really significant degrees and yet a number of these young men were quite comfortable. Of course they are handicapped. Prisms help many, re-education of the patient is valuable—operation in very selected cases and a small—very small place for muscle exercises.

Anisometropia—a large difference in the refraction of the two eyes—six. Critical refraction helps but at best there is residual inefficiency which can be minimized—absolute accuracy of refraction helps.

Retinal changes—only five showed definite retinal changes and these were mostly of minor degree. The routine changes that occur in myopia were not considered.

Ciliary injection—nine. This occurred in eyes that were apparently without congestion before the pupils were dilated. The large percentage of patients do not exhibit this phenomenon when mydriatic is used. It reveals a delicate pathological state present when the ciliary mechanism is unusually disturbed and also suggests delicate underlying infections. This finding cannot be elicited unless dilatation is induced.

Thus there were 141 conditions of unfavorable implication in these 66 young men.

CONCLUSIONS

1. Visual inefficiency is widespread among university students.
2. This is the time for laying the foundation for the preservation of vision in the last two decades of life.
3. Cycloplegia should be practiced for all students entering the university.
4. Special courses in visual education may be harmful if the greatest visual efficiency is not first assured.

Hysterectomy: Selection of the Appropriate Operation in the Particular Case*

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THE general surgeon devotes considerable time to gynecologic surgery and hysterectomy is a common operative procedure of both the general surgeon and the gynecologic surgeon. It is appropriate at this time, therefore, for us to open a discussion on this subject rather than to describe a rarer surgical procedure or a clinical entity which could be covered completely and possibly in a more scholarly manner.

For the surgeon, the female pelvis is a kindly place in which to work. Owing to its natural resistance to contamination and infection, faulty technics, unusual trauma and faulty reconstructions seldom cause anything more serious than increased hospital morbidity. Even gross errors in technic and severe infections tend to right themselves and seldom cause death. The pelvis contains no vital organs which must function to a high degree of efficiency in order that the patient may be able to carry on in a moderate degree of health. These facts give the novice confidence, make the poor technician heroic in what he will attempt and are likely to dull the experienced surgeon's enthusiasm for exercising and improving his best surgical judgment and technic.

Possibly too much significance is attached to mortality statistics at the expense of a serious consideration of morbidity and long term postoperative results. Certainly many women are unimproved after pelvic surgery. It is difficult to determine whether the failure to attain improvement is caused by faulty judgment in deciding to operate, selection of an inappropriate procedure, faulty technic or unavoidable factors. Some women have become chronic pelvic invalids because of these same factors or because of residual pelvic cellulitis or severe reaction to surgical menopause.

If morbidity of the same extent as that which often follows pelvic operations occurred after gastrointestinal operations, death would result. Selection of the inappropriate surgical operation on the stomach almost invariably results in recurrence of an ulcer or a gastrojejunal ulcer. Faulty technic results in a fatality or an unremitting retention incompatible with life. The same scrupulous technic and the same careful surgical judgment should be devoted to the selection and execution of the appropriate operation for the particular gynecologic case in hand as would be devoted if nature in this field were less tolerant. Just as much care should be exercised as if shortcomings on the part of the surgeon resulted in fatalities instead of poor results and various degrees of gynecologic invalidism.

Primary consideration in a discussion of the choice of operative procedures should be given to those patients

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who should not undergo operation. There is a tendency to attribute most of the less clearly defined clinical complaints of women to their female organs. If physical findings are at variance with normal, as occurs among most multiparas, it is at times most difficult for them to escape an operation. Many such patients, though they have minor complaints attributable to pathologic changes in the pelvis will be found after a careful history is taken to be suffering from nervous exhaustion, overwork, tension, migraine headaches or the menopausal syndrome. Operation under these conditions contributes considerably to the further deterioration of the patient's health.

Backache is infrequently caused by pathologic changes in the pelvis. Postural backaches and those caused by strain, chronic overwork, myositis and arthritis are common. Even though these and other factors are eliminated and even though a fibroid or retroverted uterus is present, hysterectomy should seldom be advised if backache is the only complaint.

When surgical intervention is indicated, there are conditions under which it should be deferred until a more opportune time. Pelvic inflammatory disease should be controlled with sulfonamide drugs and pelvic heat and should be quiescent for several months before operation is undertaken. Variable degrees of virulent cellulitis always follow abortions and the longer even necessary surgical procedures can be deferred after the abortion the better it is for the patient. If pyometra can be drained vaginally, elderly women who usually have pyometra are better surgical risks after the associated cellulitis has subsided.

For some conditions although operation is indicated, it is not urgent and the patient's interest will be best served by deferring the operation for several years. A thirty-eight year old patient may prefer to wait two or three years and then have vaginal hysterectomy and repair if the physician will assure her that she will suffer no serious ill effects from her cystocele and rectocele. The same may be true of a fifty-five year old patient who has marked prolapse which might require considerable shortening of the vagina to effect a correction. The shortening would be of less concern to her at a later date. In a series of 754¹ cases of endometriosis which I recently reported, it was found that in 50 per cent of the cases in which moderate to severe symptoms and findings of endometriosis were present, it was necessary to remove both ovaries in order to effect a cure. A young patient acquainted with these facts may prefer to carry on with her disability. An early menopause, which is the rule in cases of endometriosis, may make an operation unnecessary, or castration may be less of a tragedy several years later. Many secondary pelvic operations are necessary

because some palliative procedure has been attempted for endometriosis. To relieve symptoms either all of the endometrial implants must be removed or all ovarian function must be destroyed.

A high percentage of women requiring hysterectomy also really need pelvic repair. Of those needing repair only a few cannot get along without it. Most of them could live comfortably without plastic repair and all but a small percentage of the remainder would have only minimal inconvenience. However, there are few if any more or less elective procedures which will contribute more to the general health, strength and feeling of well-being than pelvic repair when it is needed. It will contribute immeasurably to the physical fitness of a woman forty-five years of age who still has the heavy physical burden of raising a large family before her.

VAGINAL HYSTERECTOMY

Vaginal hysterectomy has certain definite advantages to recommend it. Even when it is combined with a colopoperineorrhaphy there is almost no morbidity from it. Patients are out of bed on the fifth day after operation. If perineal repair has not been performed also, bathroom privileges have been allowed twenty hours after vaginal hysterectomy without ill effects. This fact indicates that disability which is present after vaginal hysterectomy is due chiefly to the repair work which is usually done at the same time. The operation can easily be carried out under caudal, spinal block, intravenous or gas anesthesia. A minimal amount of trauma and shock is associated. For these reasons it is the operation of choice for debilitated women, those of advanced years, those who have cardiovascular disease, diabetes and the obese.

Pulmonary embolism is almost unknown after vaginal hysterectomy and phlebitis is extremely rare, whereas, abdominal hysterectomy carries with it the highest occurrence of phlebitis and fatal pulmonary embolus of any operation except splenectomy.

Vaginal hysterectomy is the operation of choice for prolapse of moderate to severe degree, for subtotal abdominal hysterectomy cannot be depended on to support a relaxed cervical stump.

In vaginal hysterectomy the repair of a cystocele and rectocele contributes little to the length or morbidity of the operation. In fact the more the repair is needed, that is, the more relaxation that is present, the easier it is to perform vaginal hysterectomy. To do this repair in combination with abdominal hysterectomy makes for a long shocking procedure which is usually inadvisable. To do it as a separate operation incurs considerable additional operative and hospital expense and the risk of two operations and two convalescences.

As will be pointed out in the discussion of abdominal hysterectomy, there is considerable advantage to be gained by the removal of the entire uterus. In the vaginal hysterectomy as in the total abdominal hysterectomy no cervical stump remains with its potentialities of developing carcinoma or serving as a focus of chronic infection.

Limitations. Vaginal hysterectomy has a few absolute and several relative limitations. There is a definite

limitation to the size of the mass of uterus and fibroids which can be removed intact through the vagina. Usually a mass which cannot be removed intact is best removed from above rather than by morcellation from below. Some degree of pelvic relaxation and prolapse facilitates the operation. The more experienced the surgeon the larger the uterus he can remove intact and the less relaxation he finds it necessary to have. Though a virginal introitus does not adapt itself to vaginal hysterectomy the vaginas of many nulliparas adapt themselves very well. Many parous women have a higher more fixed cervix with less relaxation than some nulliparous women have.

Previous pelvic surgery is not a contraindication to vaginal hysterectomy. The difficulties that should be anticipated are proportional to the extensiveness of the operation and infection that may have been present although these difficulties actually seldom materialize. Previous suspension operations occasion little difficulty regardless of type though, of course, the difficulties are proportional to the effectiveness of the previous suspensions.

Many uteri removed vaginally are found incidentally to have endometrial implants on their posterior surfaces and in the cul-de-sacs. However, for patients who have moderate symptoms and findings of endometriosis, the abdominal route is the method of choice. The chances of finding an adherent ovary which requires removal, loops of small bowel which are adherent to the ovary or uterus and a cul-de-sac closed off because the rectum is adherent to the vaginal wall at the site of the posterior fornix are very great in cases of moderate endometriosis.

The ovaries are always inspected at the time of vaginal hysterectomy. The tubes and ovaries may be removed or left in place as indicated. Even large simple ovarian cysts present no difficulty of removal. These may be removed intact or drained and then the sac removed. The procedure employed depends on their size. However, other things being equal, if lesions involve the ovaries or adnexa, the abdominal route is best.

ABDOMINAL HYSTERECTOMY

In many cases hysterectomy by the abdominal route is the only possible procedure. If the uterus is too large to remove vaginally, if adnexal lesions, such as ovarian cyst or endometrial implants are associated with the uterine condition, if there is a virginal or unadaptable nulliparous introitus, then the abdominal route must be used.

The abdominal route has certain advantages. Abdominal incision affords an opportunity for complete abdominal exploration at the same time. With the abdomen open the uterus and adnexa can be inspected again and a final decision made with more information at hand and before the surgeon is committed to one definite procedure. Thus a myomectomy rather than hysterectomy may be found advisable. A mass that was thought to be a fibroid may be found to be an ovarian cyst or a solid tumor adjacent to the uterus. Numerous pathologic conditions such as carcinoma and diverticulitis of the colon, benign and malignant tumors of the small bowel, tumors of the kidneys and pancreas, ulcers and carcin-

mas of the stomach and cholecystitis with or without stones, have been found on exploration before they have produced clinical signs or symptoms. These may need surgical intervention more urgently than the previously anticipated hysterectomy. The abdominal route also affords an opportunity to remove the appendix which might cause difficulty at some future date.

Abdominal hysterectomy carries in addition to its own morbidity and mortality the morbidity and mortality incident to any opening of the abdomen. The abdominal soreness, gas pains and general malaise which are so conspicuously absent after vaginal hysterectomy contribute considerably to the discomfort of the patient who has an abdominal hysterectomy. Though on our service we now permit patients who have undergone abdominal hysterectomy to get up on the seventh postoperative day, it is ten days before they are active. In this period of inactivity they lose considerable strength which comes back slowly.

There has been and still is considerable controversy concerning whether the total or subtotal technic is the procedure of choice in abdominal hysterectomy. In some conditions subtotal hysterectomy is no doubt the procedure of choice while other situations almost demand total hysterectomy. The cases in which total hysterectomy is definitely indicated compose a small percentage of the whole. Aside from this group in the vast majority of cases the problem resolves itself into the choice of whichever procedure the surgeon prefers for satisfactory functional results can be obtained by either procedure.

In a certain percentage of cases of carcinoma of the uterine fundus an extension of the process will be found to the cervix. Total hysterectomy should be employed in all cases of carcinoma of the uterine fundus. In cases of malignant lesions of the ovary, both ovaries and the entire uterus should be removed.

A certain percentage of young women who have undergone subtotal hysterectomy, as they become older and their tissues become atrophic, will develop prolapse of the cervical stump. If prolapse exists preoperatively, the procedure of subtotal hysterectomy cannot be depended on to support the cervical stump. Prolapse will not occur after a properly executed total hysterectomy.

A badly lacerated and infected cervix should be removed with the uterus. Conization or cautery at the time of a subtotal hysterectomy will not destroy the glandular region or clear up the infection. A polyp bearing cervix will continue to form polyps if it is retained regardless of the type of treatment accorded it during an operation.

Under certain definite conditions the patient's best interests are served by subtotal hysterectomy. In extensive endometriosis the rectum frequently is densely adherent to the vaginal wall at the posterior fornix and to the cervix above the vagina. The ureters are often drawn close to the cervix by dense scar tissue. The vesico-uterine space may be involved. These factors contribute to the difficulty of mobilization of the uterus and proper visualization of the structures which are so essential to total hysterectomy. Under these conditions total hysterectomy is unusually hazardous and subtotal hysterectomy is preferable.

If the materials are available for reconstruction, there is no shortening or loss of mobility of the vaginal vault when total hysterectomy is done. However, if on vaginal examination a congenitally short vagina with an especially short anterior fornix, is found, some further shortening of the vagina may occur if total hysterectomy is done. Under these conditions if the cervix is clean subtotal hysterectomy is preferable especially if the patient is a relatively young woman.

For the elderly woman who has an atrophic cervix hysterectomy is usually incidental to the removal of a large ovarian cyst. The procedure which can be done most quickly with the least trauma and confines her to bed for the shortest time serves her needs best.

Carcinoma of the uterus and cervix accounts for 2.5 per cent of all deaths of women. The ratio of carcinoma of the cervix to carcinoma of the fundus of the uterus is roughly 3:1. The probabilities are, therefore, that carcinoma will occur in approximately 2 per cent of the retained cervical stumps. Black² in a report on several groups of cases of carcinoma of the cervix found that in from 2.1 to 8.1 per cent of these the carcinoma had developed in cervical stumps retained after subtotal hysterectomy. In 95 per cent of cases carcinoma arises in services which are chronically infected.

It is a common observation that many cervical stumps are ulcerated and infected. Many of them contribute to varying degrees of leukorrhea. That the cervix can be a specific focus of infection is shown by the work of Rosenow³ and Benedict and others.⁴ They demonstrated that the predominant organism cultured from an infected cervix is streptococcus and that in certain types of iritis it is this focus which causes the persistence and recurrence of symptoms. It has been shown that a casual relationship exists between infection of the cervix and Hunner's ulcer of the bladder.

In an analysis of 2,684 consecutive abdominal hysterectomies, 1,920 total hysterectomies and 764 subtotal hysterectomies, performed at the Mayo Clinic from 1935 to 1939 inclusive, certain definite conclusions were made.⁵ The mortality rate is lower from total hysterectomy than from subtotal hysterectomy and the occurrence of pulmonary embolism and thrombophlebitis is less. No subsequent prolapse of the cervical stump occurred after total hysterectomy. The patients had half a day more fever and averaged a third of a day more hospitalization after total hysterectomy than after subtotal hysterectomy.

The most striking difference between the total and subtotal hysterectomies was in the mortality. Among the 2,684 cases studied 1,497 were found in which the only variable was the type of hysterectomy done. The mortality rate in the 463 cases in which subtotal hysterectomy was performed was 0.86 per cent whereas in the 1,034 cases in which total hysterectomy was performed the mortality rate was 0.18 per cent. Here the difference in mortality rate is even more striking than in the entire group in which a mortality rate of 1.04 per cent followed subtotal hysterectomy and .078 per cent total hysterectomy.

Total hysterectomy is the operation of choice unless subtotal hysterectomy is especially indicated. It has a

lower mortality rate, a lower incidence of serious post-operative complications and these advantages are gained with little appreciable difference in morbidity and period of hospitalization. Although they do not adapt themselves to statistical analysis, the long term results and comfort of the patient are greater after total hysterectomy. In the hands of all surgeons of varying abilities these advantages of total hysterectomy over subtotal hysterectomy may be nullified to some degree. However, the occurrence of carcinoma in the cervical stump in

2 per cent of cases would in itself amply justify a preference for total hysterectomy.

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American Student Health Association News-Letter and Digest of Medical News

The Abuse of Vasoconstrictors in Hay Fever and Vasomotor Rhinitis. Sternberg (*N. Y. State Jour. of Med.*, July 15, 1944) calls attention to the over use of epinephrine, ephedrine, benzedrine and other "shrinking solutions" in the nose by hay fever and vasomotor rhinitis patients. "It appears that the allergic mucous membrane becomes refractory when in frequent or prolonged contact with these drugs for a variable period of time (three to five days) and then remains waterlogged no matter how often the vasoconstrictor is reapplied." The author recommends that vasoconstrictors be used as a spray only (not in the form of nose drops) and that they be employed in allergy cases only once or twice at most during the twenty-four hours and saved for the period of the day when the symptoms are the most severe.

Albuminuria in Applicants for Naval Enlistment. Willis A. Murphy in the August, 1944, issue of the *U. S. Naval Medical Bulletin* reported as follows on the albuminuria found among 9,994 men between the ages of 17 and 51 years examined at a Naval recruiting station:

(1) Albuminuria was present in 3 out of every 100 examined.

(2) Of the 300 cases of albuminuria found and studied 85 per cent were classified as orthostatic, 15 per cent as pathologic, and 1.3 per cent as type undetermined.

In orthostatic albuminuria according to the author:

- (1) The albumin disappears on rest.
- (2) The urinary sediment does not contain an abnormal number of casts and cellular elements.
- (3) The blood pressure is not elevated.
- (4) Renal concentrating power is unimpaired.
- (5) There is no history of renal disease.

Orthostatic albuminuria occurred almost exclusively in the younger age groups and no cases were discovered in this series over the age of 32 years. Lordosis was a common finding in the orthostatic albuminuria cases. Seasonal variation seemed also to be a characteristic of orthostatic albuminuria. While 5.3 per cent of applicants in August were found to have orthostatic albuminuria, only 2 per cent in September, 1.6 per cent in October and 1.1 per cent in December were so diagnosed.

Rapid Penicillin Treatment for GC. Rapid, simplified methods for treating gonorrhea with penicillin, which require no hospital care for the patients and which can be used conveniently by physicians in private practice or by clinics, are reported in *VDI* (August, 1944). The methods were developed to treat men from the Coast Guard and Merchant Marine, for both of which the PHS is responsible for medical care. One schedule of five treatments can be completed in only 7½ hours; another requires additional treatment the morning of the second day. Patients are required to be at the clinic or the doctor's office for only a few minutes at each of the five or six times designated for penicillin injections. The use of either of these methods, or modifications of them—whenever sufficient penicillin may become available—may make possible wider application of penicillin treatment in gonorrhea control in the national program to combat venereal diseases, where time and circumstances do not permit the use of standard 12- to 21-hour treatment schedules. The new methods have been effective in almost as large a percentage of cases as the standard schedules.

Penicillin for GC May Mask Syphilis. Penicillin used to treat gonorrhea may mask or hide syphilis symptoms in patients who have both diseases. (Van Slyke and Steinberg, *VDI*, August, 1944). It is important, therefore, that darkfield examinations be made of all suspicious lesions before starting penicillin therapy for gonorrhea, and that physical and serologic examinations be made at a later date.

Masking effect of penicillin on syphilis symptoms is due to fact that relatively small amounts of penicillin required to cure GC are sufficient to cause disappearance of spirochetes from syphilis sores, although not sufficient actually to cure syphilis. When serum from the sores is examined under darkfield microscope after penicillin has been used, spirochetes will not be seen, and the examining doctor may be misled to conclude that the patient was not infected with syphilis. Making the darkfield examination before treatment with penicillin prevents this possible error.

A blood test for syphilis some time after the treatment of gonorrhea has been completed is advisable because blood tests do not always reveal very new syphilis infections immediately after they have been acquired.

REPORT ON POLIOMYELITIS STUDIES MADE AT MINNEAPOLIS GENERAL HOSPITAL

The study of polio and therapeutic techniques pertaining to it has progressed on a broad front and with gratifying rapidity in Minneapolis. A simple, concise, definitive survey would seem to be in order. Happily, such was received recently by JOURNAL-LANCET, a copy of a report made to the superintendent of Minneapolis General Hospital by the

four doctors who have been conducting studies on the disease and by him made to the city's Board of Public Welfare, thus becoming a matter of public record. This summary, based upon work and observations of the chiefs of staffs and representing their conclusions, is deemed of sufficient interest to our readers to warrant its publication here.

October 12, 1944

Dr. F. E. Harrington, Superintendent
Minneapolis General Hospital
Minneapolis, Minnesota

Dear Doctor Harrington:

Reviewing the care and treatment of poliomyelitis patients at this hospital during the last four years, we make note of the fact that now and for many years past the acutely ill patients have been admitted to the contagious division of this hospital. These patients have been attended by pediatricians, internists, orthopedists and neurologists. Mindful that results of treatment were far from satisfactory, the staff physicians, specialists in the fields as indicated above and engaged in the practice of their respective specialties in the city of Minneapolis, held conferences from time to time to discuss progress in therapy. At that time there had prevailed an opinion that prevention might offer the greatest possibilities and that we would have to wait until immunologists had devised a better form of protection against the disease. Miss Kenny was received after she had explained her form of treatment and she was given permission by the Superintendent and Board of Public Welfare to initiate her methods in the care of poliomyelitis cases because, first of all, it was felt that no harm could come from her demonstrations; and one naturally hoped that there was at least some basis for her enthusiastic assertions.

In years gone by, we can recall when the physical therapists and orthopedists did not attend the patient until the end of the second week following the onset of the illness. This period was gradually reduced and by 1938, the orthopedists, the physical therapists as well as the neurologists attended the patient as a team from the first day of illness.

Soon after Miss Kenny came in May, 1940, we had the opportunity to observe her work. We remained open-minded but even during her first weeks and months we noted better progress in treatment and we accepted some of the methods which appeared to be of the greatest value.

Unfortunately from the start of Miss Kenny's work in Minneapolis, publicity at large became unrestrained and had far preceded the time when we might be able to appraise her methods and ideas.

The difficulties of appraising the results of Miss Kenny's methods are indeed more formidable than is commonly realized. Not until all patients who became ill during varying epidemics and were treated, have been carefully re-examined after sufficiently long intervals following cessation of treatment can it be said that a fair and trustworthy set of facts are at hand upon which a truly scientific evaluation can be based. To accomplish such a task would require the full time work of a specially trained physician working many months in the field, in many of our states and also in some foreign countries.

Quite mindful of the fact that at this time our observations are still inadequately comprehensive, we nevertheless venture to express our confirmation of the following positive achievements attributable to the Kenny method: a) the comfort of the patients acutely ill has been materially enhanced, b) the general condition of patients treated by her methods for an appreciable period of time is better than during the days before the coming of Miss Kenny, c) the muscle shortening or "spasm" as it is termed by Miss Kenny, is now being managed decidedly more successfully: 1. it is being treated earlier, 2. immobilization is at a minimum, 3. treatment is persistent; d) the incidence of deformity is very definitely decreased; the incidence of scoliosis and pelvic obliquity thus far have shown great reduction; e) muscle reeducation begun early as insisted on by Miss Kenny, has been a very favorable contribution; f) the application of hot packs or fomentations according to her method appears to us as a worthwhile and useful method; but it takes more than packs to avoid shortening of muscles; g) the emphasis by Miss Kenny on the importance of retraining the patient to establish a normal pattern of coordination of movement in the various muscle groups affected is quite justified. By this means the functional efficiency of the weakened muscle is greatly increased.

In addition, however, we wish to mention the following points in which we disagree with Miss Kenny's methods and theories: a) we believe that the incidence of denervation is apparently not influenced by her treatment; b) we do not regard mental alienation as a factor of significance in the causation of loss of muscle function; c) Miss Kenny's ideas of individual muscle function are interesting but unproved; d) no proof exists that muscular disease is attributable to direct virus involvement as has been stated by her. Furthermore, we believe that Miss Kenny has made inaccurate comparisons of patients treated by her methods and by other methods.

By and large, the members of the medical profession who have opportunities to study and observe the work of Miss Kenny will judge her efforts fair-mindedly, and there should be little doubt that factual descriptions of techniques employed and phenomena observed by her will bring to herself the sincere attention of those interested in poliomyelitis.

(Signed)

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Dr. S. Marx White
Dr. H. M. N. Wynne
Dr. Thomas Ziskin
Secretary

LANCET PUBLISHING CO., Publishers, 84 South Tenth Street, Minneapolis 2, Minnesota

MINNEAPOLIS, MINNESOTA, JANUARY, 1945

The New Year

In spite of international turmoil and strife we still can think of no better wish for our readers, so we say HAPPY NEW YEAR as of old; in fact with more fervent feeling than ever, with greater intensity because of the overhanging clouds that have saddened individual hearts and dampened the accustomed cheer and festivities usually associated with this season. May fears and forebodings be dissipated and sorrows assuaged for those whose losses are already known. We welcome the New Year although we do not know what it has in store. It has mysterious possibilities.

"A flower unblown; a book unread; a tree with fruit unharvested;
A path untrod; a house whose rooms lack yet the heart's divine perfumes;
A landscape whose wide border lies in silent shade 'neath silent skies;
A wondrous fountain yet unsealed; a casket with its gifts concealed—
This is the Year that for you waits beyond to-morrow's mystic gates."

A.E.H.

"WHO SHALL DECIDE WHEN DOCTORS DISAGREE?"

Nothing gives an editor more satisfaction than to publish an article that arouses controversy. The JOURNAL-LANCET editors have always been eager to hear from their subscribers either in agreement or criticism—in short they are always hoping to start an argument among its readers, for well they know that where there is controversy there is life.

Doctors as a class are probably the most individualistic of all men. Hence they are bound to disagree. But unfortunately however articulate they are in meetings and when two or three come together, they too seldom feel moved to rise up and defend their opinions on paper. In this issue, however, an army captain has sprung into action.

Perhaps you will recall last April in our tuberculosis issue the paper of Dr. J. A. Myers in which he criticized to some extent the army's induction program regarding tuberculosis ("Failure to Detect All Tuberculosis on Induction to Military Service"). Captain Daniel L. Fink, stationed at Ft. Snelling, Minnesota, comes to the defense of these methods in the article we publish on page 5.

Captain Fink says in introducing that paper: "Recently there appeared in the JOURNAL-LANCET an article criticizing the induction program regarding tuberculosis.

Since that paper may leave its readers with an entirely biased and in many respects erroneous impression concerning the army's program of chest examination for the detection of tuberculosis, the following facts are presented to clarify the situation." And in a letter to Dr. Myers: "I am well aware the material presented is highly controversial but that progress in this field can only be made with open discussion with all views presented. Any subsequent reference to my paper whether in agreement or not will nevertheless be interesting, because I think, as you do, that this subject should be 'aired.' My reference to a more ideal program for the detection of tuberculosis in the military service was unfortunately not more fully discussed in my paper because of war department restrictions."

To which Dr. Myers rejoins: "We are going through the same controversy regarding the tuberculin test in this war that we went through regarding x-ray inspection of the chest in the last war. Although the x-ray controversy failed in the first war, the procedure was adopted for the present conflict. I have no doubt the same situation will obtain soon after the peace with reference to the tuberculin test. I think it is fine that Captain Fink has prepared and submitted this article."

How about it? Does anyone else want to take sides?

M. U.

Book Reviews

The Urinary Tract, a Handbook of Roentgen Diagnosis, by H. DABNEY KERR, M.D., Professor of Radiology, State University of Iowa College of Medicine, and CARL L. GILLIES, M.D., Associate Professor of Radiology, State University of Iowa College of Medicine, Iowa City. Chicago: Year Book Publishers, Inc. Cloth, 320 pages with numerous illustrations. 1944. Price, \$5.50.

The contents of this ready reference handbook are based on cases studied radiographically at the State University of Iowa Hospitals. It is divided into sections on the kidney, ureters, bladder and urethra. The roentgenographic reproductions are largely confined to the area under consideration, eliminating irrelevant portions of the film. All reproductions are of unusually good quality, considering the fact that no "dodging" methods have been used. Usually four reproductions are presented on one page with a short descriptive and informative caption on the opposite page. Indexing on each page assists in rapid reference to any particular subject.

This book is of great interest and aid to the radiologist, probably even more so to student and practitioner.

Gastroenterology. (In three volumes.) Vol. II: The small and large intestine and peritoneum. By HENRY L. BOCKUS, M.D. Philadelphia: W. B. Saunders & Co., 1944; 975 pages, 176 illustrations, 12 in color, 3 volumes, \$35.

The promise offered by the excellence of the first volume of the three-volume work on gastroenterology has been amply fulfilled by Bockus in the second volume now available. Only a clinician of wide experience could write authoritatively of diseases of the intestines and peritoneum. Many good treatises on disorders of the colon have been published, but no recent volume has been issued dealing with small bowel. The small gut

is admittedly an obscure field, fortunately the site of few organic lesions but indubitably the source of a great deal of functional disturbance.

The chief author has advantageously included chapters on particular phases by associates, notably carbohydrate dyspepsia by Berk, intestinal obstruction by Tumen, colitis by Monaghan, dysentery and granulomas by Bowles, rectal diseases by Pessel and the peritoneum by Rhoads. Tumors of the colon and rectum are discussed by Berk and diverticula by Thomas A. Johnson. Each of these contributions, definitive for the particular subject, is flavored by the opinions of the senior author and thereby enhanced in value for the general practitioner or the gastroenterologist. The third volume, to be concerned with liver, biliary tract and pancreas, is eagerly anticipated.

Sternal Puncture, a Method of Clinical and Cytological Investigation, by A. PINEY, M.D., M.R.C.P. London, and J. L. HAMILTON-PATERSON, M.D., M.R.C.S. Edgware. Second edition, 1944, New York: Grune & Stratton. 72 pp., 13 color plates and various drawings and tracings. \$3.50.

The second edition of a publication concerned with studies of the bone marrow indicates not only the importance of the subject but is a tribute to the clarity and completeness with which A. Piney presents methods, describes the cellular morphology, and relates observed changes to clinical conditions. The cellular elements present in living bone marrow are more nearly comparable to similar constituents of circulating peripheral blood than are those commonly observed in fixed sections of specimens obtained postmortem. Particularly the colored plates should be informative to the occasional microscopist and also to the experienced hematologist. In spite of governmental restrictions, the publishers have reproduced the colors with remarkable accuracy. The descriptive legends are simple and easily understood. The style of the text is concise, but inclusive of all pertinent data. The monograph is a worthy successor to the justly popular clinical atlas of blood diseases published fifteen years ago. It is a tribute to the imperturbable British spirit that this monograph should have been published, revised and re-issued between the years 1941 and 1944.

News Items

Dr. O. J. Esser, Gibbon, Minnesota, was elected president of the Redwood-Brown Medical society at its quarterly meeting held at New Ulm, Minnesota. Other officers elected were: Dr. J. H. Vogel, New Ulm, vice president, and Dr. O. B. Fesenmaier, New Ulm, secretary. Dr. H. H. Young of the Mayo Clinic was the main speaker of the meeting.

At a symposial discussion of tuberculosis considered as a hazard with the return of our armed forces, the Commonwealth Club of Minneapolis was addressed by five physician-surgeons at its regular meeting November 30 at the local YMCA. Participating were Dr. Charles R. Drake, leader, Dr. Russell R. Heim, Dr. C. E. Dutton, Dr. C. M. Roan and Maj. Danl. H. Bessesen, U.S.A., Vancouver, Washington. Maj. Bessesen substituted for his father, Dr. A. N. Bessesen, recovering from an operation in a Minneapolis hospital. All the doctors are members of the Commonwealth Club. The discussion was preceded by the showing of a motion-sound film, "Mass Radiography," recently released from England.

Dr. J. B. Bailey, Rapid City, South Dakota, was elected president of the Ninth District of the South Dakota state medical association, at a recent meeting. Other new officers elected were: W. A. Dawley, Rapid City, vice president; Dr. N. Wells Stewart, Lead, secretary-treasurer; Dr. Lyle Hare, Spearfish, censor.

Dr. G. G. Thorgrimson, Grand Forks, North Dakota, read a paper at a meeting of the Fortnightly club. The subject was "Doctor, Your Medicine Made Me Worse."

Dr. G. A. Hedberg, medical director and superintendent of Nopeming sanatorium, Minnesota, delivered the 11th annual John W. Bell lecture on tuberculosis before members of the Hennepin county medical society on December 4th.

Dr. G. Harmon Brunner, Dr. Henry Kermott and Dr. Robert B. Woodhull of Minot, North Dakota, and Dr. John C. Smiley of Deadwood, South Dakota, have been accepted into fellowship in the American College of Surgeons.

A memorial fund has been established for the furthering of the work of Dr. Ernest L. Meland of Minneapolis, who died December 3, 1944, with the following committee in charge: Erling S. Platou, M.D., Raymond L. Scherer, M.D., C. D. Creevy, M.D., Mr. Ralph R. Overholt and Mr. Frank J. Lynch. Anyone wishing to contribute to this fund may send check to Mr. James Baker, Medical Arts Building, Minneapolis.

Brigadier General James S. Simmons, recently the JOURNAL-LANCET's engaging guest and lecturer, was chosen "President-Elect" of the American Society of Tropical Medicine at its annual meeting held in St. Louis November 13 to 16.

Dr. Frederick N. Solem of Spicer, Minnesota, has accepted a position on the staff of the state hospital at Walker.

The Army Medical Department has grown from 8,010 at the beginning of World War I until it now numbers 680,891. Of this number approximately 44,651 are in the medical corps, 14,948 in the dental corps, 2,012 in the veterinary corps, 2,364 in the sanitary corps, 15,078 in the medical administration corps, 59 in the pharmacy corps, 40,305 in the army nurse corps, and there are 559,327 enlisted men, 813 physical therapy aides, and 1,334 hospital dietitians.

In Memoriam

Ernest L. Meland, M.D.

1901 - 1944

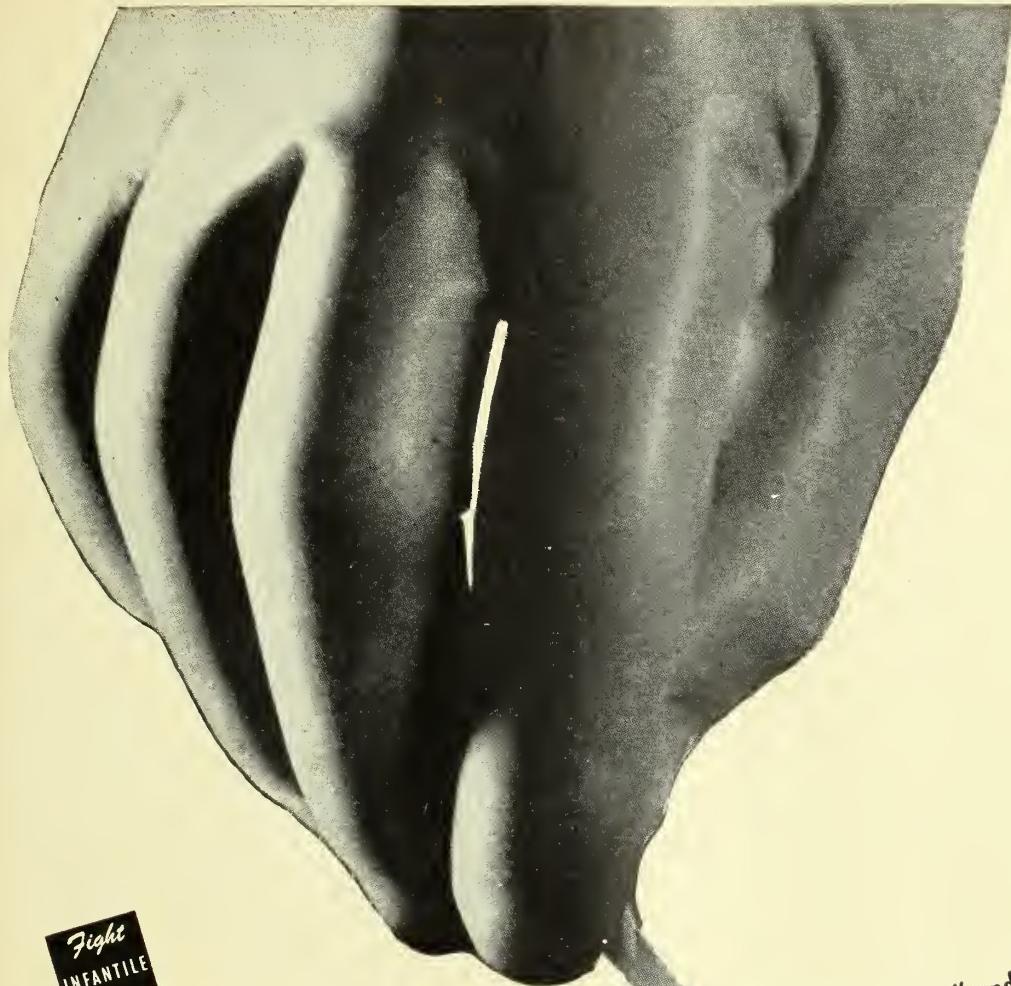
Ernest Meland was one of four sons of the Reverend Andrew Meland, a Lutheran minister, of Pelican Rapids, Minnesota. After growing up in that small community, he attended and graduated from St. Olaf College and the medical school of the University of Minnesota. After serving during 1926 as an intern at the Minneapolis General Hospital, he established a highly successful general practice at Dalton, but left it in 1929 to become a fellow in urology in the Mayo Foundation. He remained there, finally as first assistant to Dr. Hugh Cabot, until November 1932. At that time he married Mary Tobin, formerly of Worcester, Massachusetts, a physiotherapy technician at the Mayo Clinic, and then entered the practice of urology in Minneapolis.

He became an instructor and later a clinical assistant professor in urology in the medical school, but his remarkable success in private practice soon compelled him to give less and less time to formal teaching. This success was no accident, but was due in equal measure to his solid ability, his good judgment, his delightful personality and to his forthright honesty and dependability. It is significant that, although in recent years he was one of the most active physicians in Minneapolis, a great many of his patients have said "Ernie was not only my doctor, he was one of my best friends."

His tragic illness and death resulted from one of those ironical jests sometimes perpetrated by nature: a silent neoplasm which gave no evidence of its presence until it had metastasized. Overwhelming evidence of the high regard in which he was held by his patients, friends and colleagues, is attested by the innumerable requests to be allowed to help evoked by the news of his illness.

His untimely death is a severe loss to the community, both personal and professional, and is one which cannot be expressed adequately by mere words. Suffice it to say that he was a fine, able, and thoroughly honest man.

C. D. CREEVY, M.D.



Fight
INFANTILE
PARALYSIS
JAN. 14TH-31ST

SKILLFUL SURGERY—BUT—how about postoperative "gas pains" and catheterization? Even the most skillful surgery can be followed by the post-operative complications of abdominal distention and urinary retention. The routine use of Prostigmin Methylsulfate* 1:4000, however, provides a convenient and effective means of preventing these distressing and painful disorders, affording the patient a faster, more pleasant recovery . . . HOFFMANN-LA ROCHE, INC., NUTLEY 10, N. J.

*Neostigmine Methylsulfate.

Prostigmin Methylsulfate 'Roche'

Necrology

Dr. Hiram Bryan Cloud, 59, Wolf Point, Montana, died October 31, from a skull fracture received in an automobile accident, while hunting. Dr. Cloud served his community as postmaster as well as physician. Born in Clinton, Illinois, Dr. Cloud received his medical degree from Rush Medical college, Chicago. He had served as a lieutenant in the medical corps in World War 1.

Dr. Herbert Davis, 85, St. Paul, died at his home November 16. He had practiced medicine in St. Paul for 56 years and had a devoted following.

Dr. Reuben M. Pederson, 65, Minneapolis, died November 20, after a long illness. Dr. Pederson had served overseas in World War 1 as a lieutenant colonel, commanding the 109th sanitary train of the 34th division. He was buried at Fort Snelling National cemetery.

Dr. E. P. Christensen, 64, Two Harbors, Minnesota, died at his home November 10. Dr. Christensen after serving Two Harbors and Lake county for 37 years had retired from practice November 1, following the sale of the Two Harbors hospital to the Community Health Center.

Dr. Clarence A. Rathbun, 53, St. Cloud, Minnesota, was killed November 15 while hunting. Dr. Rathbun had practiced in St. Cloud for 30 years.

Dr. James M. Gibbons, 63, retired eye, ear, nose and throat specialist of Bismarck, North Dakota, died November 24 at a hospital in that city. A native of Iowa, Dr. Gibbons was a graduate of Northwestern University medical school and had practiced in Almont, Finley and Bismarck. A brother, Dr. Frank Gibbons, lives in California.

Dr. Justin C. Simpkins, 89, Glasgow, Montana, died at his home November 26 after two years of invalidism. He was born at Williamsport, Indiana, received his medical training at Rush medical college and at the Medical College of Indiana at Indianapolis. In his young manhood he was captain of his father's steamboat on the Wabash river, later teaching school in Indiana. He held licenses and practiced medicine in his home state, Illinois, North Dakota, Nevada and Montana.

Future Meetings

Dr. Wm. C. Rose, professor of biochemistry at the University of Illinois, will present the annual Elias Potter Lyon lecture at the University of Minnesota on January 18, 1945. Dr. Rose will speak on "The Amino Acid Requirements of Man." The Elias Potter Lyon lectureship was established at the University of Minnesota Medical School in 1937 in memory of Dean Elias Potter Lyon, dean of the medical school from 1913 to 1935.

Classified Advertisements

FOR SALE

One Bausch & Lomb microscope No. 42358: $\frac{1}{3}$, $\frac{1}{6}$ and $\frac{1}{2}$ oil immersion lenses: with bell-jar and carrying case. The lower part of the microscope is black, the upper part all brass. Microscope is in excellent condition. Also a large collection of medical books, latest editions, in medicine, surgery and dermatology: send for lists. These items priced to sell. Address Box 814, care of this office.

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MEDICAL OPPORTUNITIES: (A) Internist; South Dakota group; salary open. (B) Obstetrician-gynecologist; well established Montana group. (C) EEN&T specialist, Montana clinic, good hospital facilities. (D) Industrial physician; Minnesota; about \$5400. (E) Assistant; general and obstetrical work; Minnesota group; to \$600 monthly. (F) EEN&T specialist; northern Minnesota group; salary open. Aznoe's-Woodward Bureau (Ann Woodward, Director), 30 North Michigan Ave., Chicago.

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Advertisers' Announcements

FIRST ANNUAL BORDEN AWARD

"For outstanding achievement in research in nutrition of infants and children," Dr. Harry Gordon, assistant professor of pediatrics and Dr. S. Z. Levine, professor of pediatrics, at the Cornell university medical college were joint recipients of the first annual Borden award to be administered by the American Academy of Pediatrics. Presented at the academy's wartime conference on child health in St. Louis, Missouri, the award was made for metabolic studies on the nutritional requirements of premature and full-term infants. These studies contribute a physiologic basis for individualized feeding.

The Borden awards which carry with them a commemorative gold medal and \$1,000, were established in 1937 to encourage and give recognition to scientific research in the fields related to the food industry. They are administered by seven scientific associations.

REED & CARNICK ADDS DR. C. T. VAN METER

Recent changes in the laboratory set-up of Reed & Carnick, Jersey City, N. J., include the addition of Dr. Clarence Taylor Van Meter, assistant professor of chemistry and physics in the University of Pittsburgh College of Pharmacy, as scientific director. Dr. Van Meter holds the degrees of Ph.G., B.S., and Ph.D. from the University of Pittsburgh, and has been connected with the faculty of the institution since 1926.



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This new and highly effective method for the *local* treatment of certain oropharyngeal infections offers these outstanding clinical advantages:

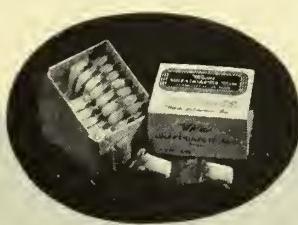
1. Chewing one tablet for one-half to one hour provides a high salivary concentration (averaging 70 mg. per cent) of therapeutically active sulfathiazole . . .
2. that is maintained in *immediate* and *prolonged* contact with oropharyngeal areas which are not

similarly reached by gargles or irrigations . . .

3. yet even with maximal dosage, resulting blood levels are so low that systemic toxic reactions are virtually obviated.

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Sodium Sulfamerazine solution should be injected slowly under aseptic conditions either by means of a large syringe or as an intravenous infusion. The escape of any of the fluid into the tissues during intravenous administration should be avoided as the solution is strongly alkaline (pH 9.6). Solution Sodium Sulfamerazine should not be administered in connection with a blood transfusion.

The solution is supplied in two sizes and dosage strengths, which have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association. The 50 cc.

ampul of 6 per cent solution is ready for intravenous use. The 15 cc. ampul of 20 per cent solution must be diluted to 50 cc. before administration, or added to an intravenous infusion, either directly or by the way of the rubber tubing.

The dosage of approximately 0.05 Gm. of Sodium Sulfamerazine per kilogram of body weight ($\frac{1}{3}$ grain per pound) for the initial dose results in the immediate establishing of approximately 15 to 20 mg. of free sulfamerazine per 100 cc. of blood. The number of doses necessary depends upon the maintained blood level.

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A completely modernized version of Schering's *Handy Index to Hormone Therapy* is available to physicians and pharmacists. The *Handy Index* is a highly useful compilation of data in the hormone field, covering indications, pathogenesis, therapy, rationals and dosage. These data are presented in a highly compact index, bound on one side with a metal spiral binder and protected by a transparent acetate cover. Each therapeutic indication and hormone preparation is attractively tabbed for ready reference. In order to assemble the data compressed into this $3\frac{1}{2} \times 5$ " index, considerable source material was sifted for important factual contributions. This material has been brought up-to-date. All indications have been examined in the light of the most recent findings, and many indications which were in the experimental phase at the time of first publication have been added, with specific uniform dosage. New preparations such as Estinyl Tablets, Oreton-F Pellets and Cortate for sub-lingual administration are included.

Copies of the *Handy Index* are available to physicians from the Medical Research Division, Schering Corporation, Bloomfield, New Jersey.

ROCHE-ORGANON'S DI-PRO AMPULS

Roche-Organon, Inc., hormone manufacturers of Nutley, New Jersey, number in their roster of quality products Di-Pro Ampuls. The simplified treatment for functional secondary amenorrhea which was introduced several months ago by Roche-Organon as Dimenformon Benzoate + Progestin, the name is a shortening of this term. It is a combination package containing two ampuls of Dimenformon Benzoate (2.5 mg. each) and two ampuls of Progestin (12.5 mg. each). In treating patients with functional secondary amenorrhea of less than two years' duration, the contents of one of the Dimenformon Benzoate (alpha-estradiol benzoate) ampuls and of one of the Progestin (progesterone) ampuls are mixed in the same hypodermic syringe and injected on two successive days. This new treatment has several advantages over the previously employed method. The duration of treatment is reduced from twenty-five to two days; only two injections—instead of a minimum of thirteen—are required; and the possibility of accentuating the inferiority complex of the patients under treatment is obviated. Before instituting this new DI-PRO AMPUL treatment of secondary amenorrhea the physician should rule out non-endocrine etiologic factors, such as constitutional disorders (tuberculosis, diabetes and syphilis) and local pelvic lesions (neoplasms, degenerative or inflammatory diseases, and malformations). The absence of pregnancy should also be established before treatment is initiated even though the use of Di-Pro ampuls will not affect gestation.

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"...improvement
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decreased pain, greater mobility,
reduction of deformity, and
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The JOURNAL LANCET

Minneapolis, Minnesota
February, 1945

Vol. LXV, No. 2
New Series

Foreword

Thomas Parran, M.D.

Surgeon General, United States Public Health Service

VIEWING the past and the future from the vantage point of the JOURNAL-LANCET's Seventy-fifth Anniversary, we can speak with pride of the accomplishments in health and medical science; we can look forward to even greater achievements in the future.

Recent discoveries for the prevention and cure of disease emphasize the dynamic quality of medical science. Even more, these revolutionary changes are reshaping the concept of public health and medical practice. No longer is it solely a fight against death. It is also a fight for life — and for a life richer in physical and mental health than we have yet envisioned.

While medical science becomes surer and surer in its technics, the need grows to put it to use for all of the people. Compared with the science we may expect of the future, our present knowledge is no greater than that of a child; but it is incredibly vast compared with the knowledge we now put to use. Indeed, health and longer life for a majority of the people are practical, attainable zones — if we but use fully the knowledge and skills we already possess.

We cannot attain these goals by proclaiming them. Their attainment must be planned for and organized. We should plan now to use fully all

that is known for the prevention of disease in all parts of the country, thus reducing the volume of illness. We should plan now to make good medical care available to every citizen.

Needs for a healthful environment should be met. More physicians, dentists, nurses and other professional workers must be trained for the tasks ahead. Hospitals and health centers should be brought up to acceptable standards throughout the country. More research into the causes, prevention, and cure of many diseases is needed. To accomplish these specific purposes, sound means must be found for meeting the costs of a comprehensive national health program.

Some of these goals have been termed "impossible." The lesson of the war has taught us that our country possesses the physical resources, the brains, and the manpower to accomplish a thousand "impossibles" for winning the victory. It is unthinkable that the professions, the public, and the Nation's leaders will reject this proved ability in the face of a greater challenge — winning the peace. With the full use of all resources, with the active participation of all groups, we can plan confidently to go forward in a cooperative enterprise for national health. In so doing, we shall demonstrate the democratic principle of mutual responsibility for the common good.

Recent Advances in the Control of Insect-Borne Diseases*

James Stevens Simmons, M.D.[†]

Brigadier General, U. S. Army

THE United States Army is now carrying on two total wars; one against the Axis, the other against the insects which transmit disease. We are making excellent progress in both wars. American soldiers are smashing through Axis defenses in Germany, Italy and the islands of the Pacific, and on every front our new insecticidal weapons are winning equally great victories over the winged agents of disease. Since these weapons are important to all of us, I wish to talk to you about their evolution, their present military uses and the promise which they hold for improving civilian health after the war.

Insects have always played a dominant role in the life of our planet, outnumbering all other forms of animal life. Even before primitive man evolved from his ape-like ancestors, many families of insects could claim an ancient, if not always honorable, lineage. Certain insects have always been useful to man, but there are innumerable species which year in and year out have destroyed his crops and threatened his health, and whose control is, consequently, of the utmost importance.

The biting insects have always been recognized as pests, and have long been suspected to be the companions of pestilence. However, it is only within the past sixty-five years, that the roles which certain insects play in disease transmission have been defined and that progress has been made toward controlling the infections which they transmit. In large part this progress has been due to the work done by Army medical officers stationed in Cuba, the Philippines, Panama and elsewhere. The names of Walter Reed and Gorgas will always be associated with yellow fever, that of Craig with malaria, that of Strong with plague, and that of Siler with dengue fever. To these men and to their associates and followers we owe the successful control of insect-borne diseases in the fixed installations of our peacetime Army.

At the onset of the present war in Europe, when it seemed probable that we would be drawn into the conflict, the Surgeon General organized an extensive program of preventive medicine to protect American troops against all the diseases to which they might be exposed. Since we could not predict where our troops might be sent, the plagues of every land were considered potential hazards, and plans were made to combat them. This program naturally included plans for controlling exotic insect-borne diseases under combat conditions in the field. Under such conditions, control measures must be limited in large part to those which can be taken by the individual soldier. For this reason the need for better insecticides and insect repellents became acute, and steps were taken to provide them.

*Journal-Lancet Lecture given at University of Minnesota Dec. 7, 1944.

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Early in 1940, the Army initiated an extensive search for such agents. This search, which has already paid rich dividends, and which still continues, has been carried on in cooperation with many agencies. These include: the National Research Council, the Committee on Medical Research, the Bureau of Entomology and Plant Quarantine, the U. S. Department of Agriculture, the U. S. Food and Drug Administration, the U. S. Public Health Service, the Rockefeller Foundation, the Gorgas Memorial Laboratory and various universities and commercial companies. Many of the country's most able scientists have concentrated on the problem, and millions of dollars have been spent in attempting to solve it. The results of all these investigations have been analyzed and coordinated by a special Committee on Insecticides, sponsored by the National Research Council, and this committee has recommended to the armed services the valuable series of new insecticides and repellents now in use. These agents have revolutionized our military methods for the prevention of louse-borne, epidemic typhus and for the control of malaria and other mosquito-transmitted diseases.

CONQUEST OF TYPHUS

The disease most dreaded by the Army when we entered this war was epidemic typhus fever, which is carried by the body louse. Unlike its mild, flea-borne relative in this country, it is a highly fatal disease which spreads rapidly from man to man. It burrows around among the poverty-stricken, louse-infested populations of certain endemic centers, hiding its full malignancy until conditions arise which interfere with sanitation and encourage the breeding of lice. Then it flares forth from these foci, causing devastating epidemics. It has played such an important part in European history that it has been called "European typhus." Its influence on the outcome of all the great wars on that continent has been enormous. In 1914 an epidemic which started in the Serbian army killed 150,000 people in six months, and then spread over the eastern front. Between 1917 and 1923 there were 30,000,000 cases and 3,000,000 deaths in European Russia alone. Fortunately typhus did not spread to the western front, and, although many of our soldiers were infested with lice, they did not contract it.

Before we entered the present war, Medical Intelligence reports showed that the disease still smoldered in its ancient endemic foci, and plans were made to protect our troops against possible epidemics. As the war progressed and later reports showed a continuous build-up of the infection in certain parts of Europe, a typhus control program was put into effect in the Army which included the following measures: (1) the use of a concentrated Cox vaccine for all troops sent to continents

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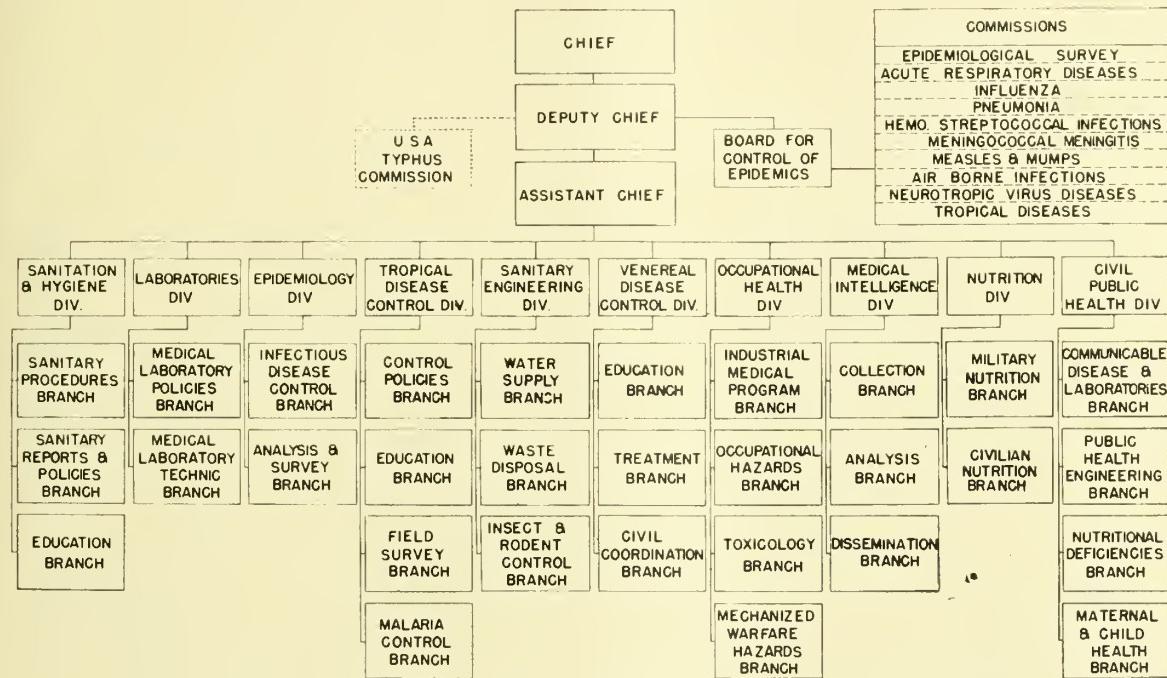


Fig. 1.

and regions where the disease exists, (2) the collection of current statistics about the world prevalence of the disease, (3) the adoption of the best methods available for delousing troops and their equipment, and (4) the initiation of a special Army, Navy and Public Health Service organization, called the U. S. A. Typhus Commission, to fight typhus wherever it might occur. This program has been highly effective.

As you know, the delousing methods used during World War I were both cumbersome and time-consuming. Soldiers were deloused through bathing, shaving and the application of temporary louse-killing agents. For the delousing of clothing and bedding, we relied largely on steam sterilization. During the last two years we have obtained a series of agents for delousing both troops and their clothing which are not only more effective than the old methods, but which can be used far more conveniently under conditions of rapid mechanized warfare.

For delousing clothing the Army now uses methyl bromide fumigation, employing a method which was developed by the Department of Agriculture early in 1942. Methyl bromide is a liquid which vaporizes rapidly at ordinary temperatures, and can be used in the gaseous state to destroy both lice and their eggs without injury to clothing or equipment. The liquid is supplied in metal containers about the size of an ordinary beer can, and in ampoules, and the gas is liberated in special knock-down, ply-wood portable chambers which can be easily transported. Field tests show that in such a chamber a fumi-

gation and bath company of 88 men can delouse the clothes of an entire division within 48 hours. The clothing of an individual soldier can be deloused by placing it in a gas-proof bag. In 1942 special methyl bromide delousing plants were installed in the chief ports of embarkation for the fumigation of large contingents of troops and prisoners of war entering the United States from abroad.

This procedure for delousing clothing is supplemented by the use of newly developed powders for delousing the soldier himself. Previously, powdered sulphur was used for this purpose, but in August, 1942, the Army, after considerable experimentation by the Department of Agriculture, adopted a standard louse powder known as MYL. This powder contained pyrethrum and an activating substance which increased its effectiveness about forty times. It was packaged in a 2-ounce pepper type can and distributed on the basis of one per man per month to troops in areas where typhus is prevalent. When dusted on the body and on the surfaces of clothing, it kept a man free of lice for about one week. The MYL powder was used experimentally in native villages in Mexico and Egypt and the results of these tests showed that by this method alone it would be possible to delouse large, infested populations. At that time we began to feel that we had our typhus problem licked so far as the U. S. Army was concerned.

Later in 1942, however, an unforeseen circumstance interfered with the production of MYL. This circumstance was a change in the monsoon season in the distant

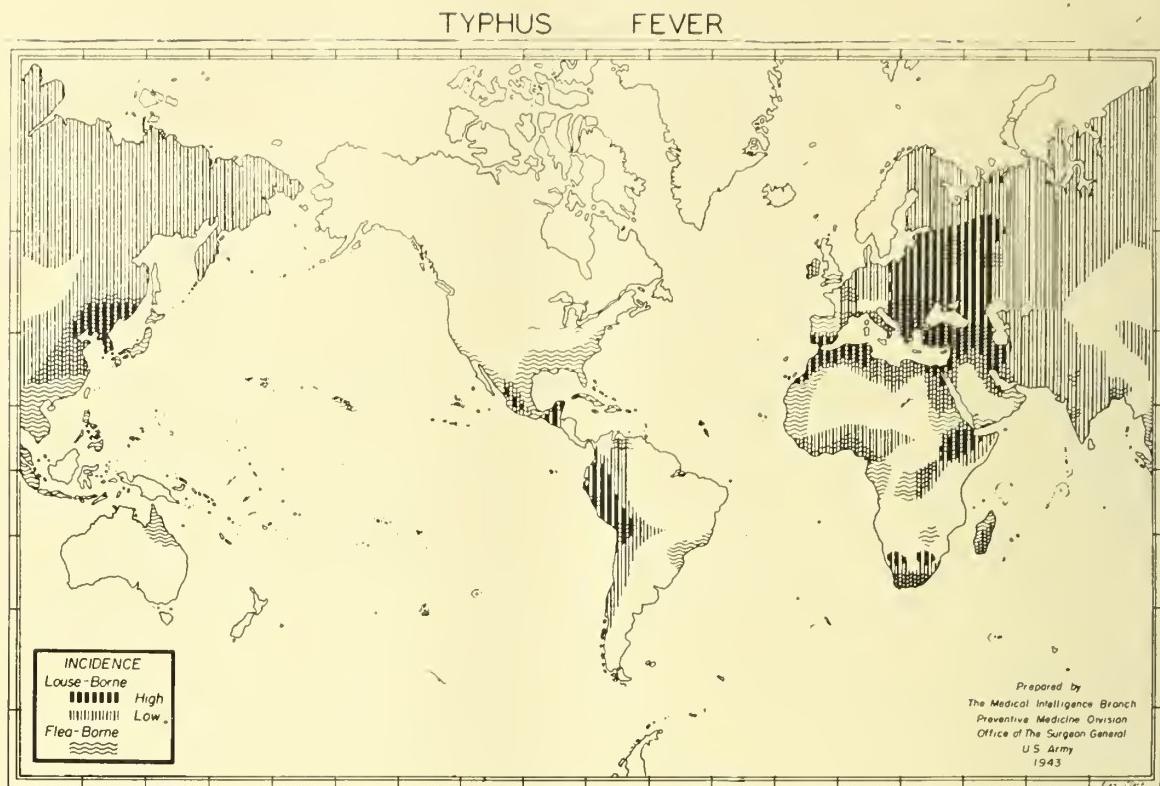


Fig. 2.

East African colony of Kenya, which supplies us with pyrethrum. As a result of the altered weather conditions, the production of pyrethrum was drastically curtailed, and with it, our manufacture of MYL. A search for a substitute was commenced at once, and luckily, fortune was good to us. It was not long before the Department of Agriculture drew the Army's attention to a new chemical, called dichlor-diphenyl-trichlorethane, which was to prove a far more effective insecticide than any of our old preparations.

This substance was first prepared commercially in Switzerland, where it appeared on the market in 1939, under the name of Gesarol, and was used to destroy certain agricultural insect pests. After its introduction into this country, an exhaustive investigation of its insecticidal and toxic properties was begun, to determine whether it was effective enough and safe enough for military use. It was found to have a rapid and prolonged lethal effect against lice and other insects, and, fortunately, final toxicity tests proved that it could be employed with safety. On May 26, 1943, a new louse powder containing 10 per cent of this chemical, now popularly known as DDT, was adopted for Army use. With it a new and exciting chapter in the conquest of insect-borne disease was begun.

At first DDT was used only to supplement other methods of delousing, and was distributed, principally for use by individual soldiers, to a few areas only. Meanwhile further tests continued to demonstrate its remarkable potency. In one prisoner of war camp, 252 men,

77 per cent of whom were infested with lice, were dusted with DDT. When they were re-examined sixteen days later, not a single louse was found. It is now known that after a soldier's clothes are thoroughly dusted with DDT powder, he will remain free of lice as long as a month, even though the clothes are washed at weekly intervals.

In North Africa, where extensive field studies were carried on by Army Medical Officers in cooperation with the U. S. A. Typhus Commission and investigators of the Rockefeller Foundation, the superiority of DDT as an insecticide for delousing was demonstrated on a larger scale. It was shown that by simply dusting DDT powder under the clothing of large groups of soldiers, prisoners, refugees and civilians, by means of an apparatus using compressed air, they could be deloused without removing their clothing or bathing.

It was not long before an unusual opportunity arose to test the worth of DDT under circumstances of the utmost gravity. I refer to the Naples typhus epidemic, the control of which ranks with the epic conquest of yellow fever in Panama as one of the most spectacular examples on record of successful military preventive medicine. Throughout the summer and fall of 1943 there had been a progressive increase in the incidence of typhus fever in Naples, and by December of that year about fifty cases were being reported each day. Since typhus had not occurred in Naples for generations, the population was highly susceptible and a devastating epidemic was feared. DDT dusting stations, some of which were capable of delousing 5,000 persons a day, were set

MALARIA

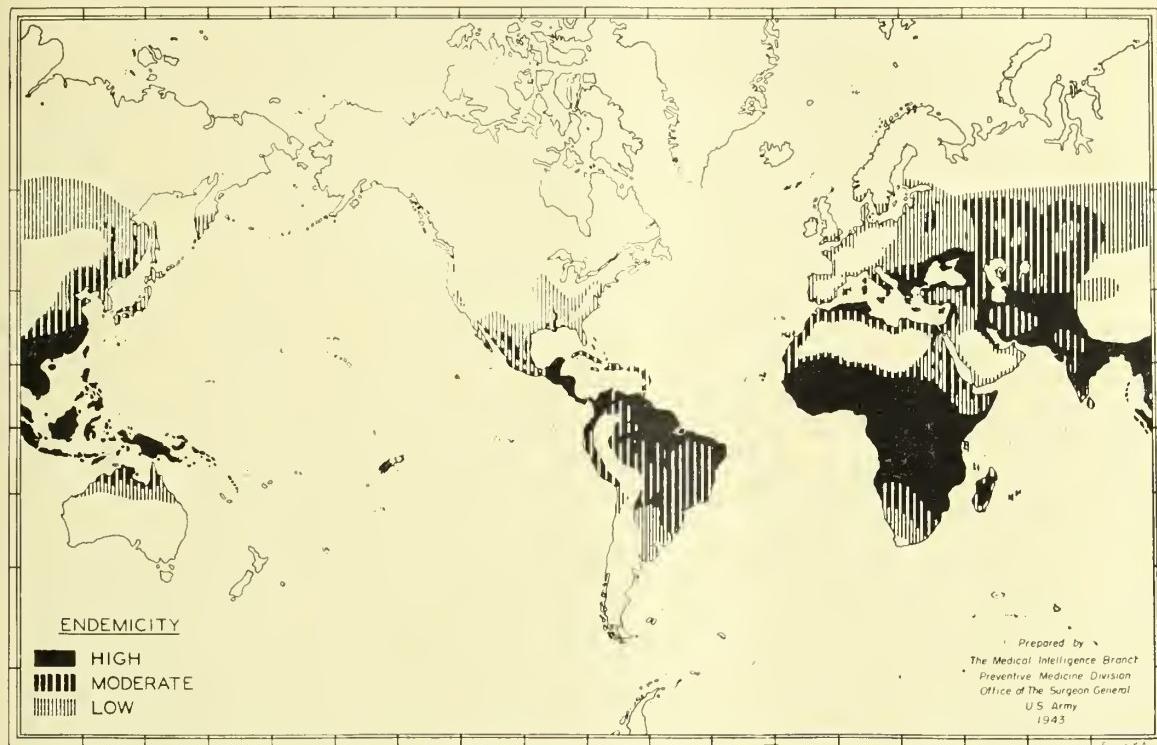


Fig. 3.

up immediately in all parts of the city. By March of 1944 more than a million and a quarter persons had been treated at these stations. This delousing was supplemented by an extensive vaccination program. The epidemic declined immediately and was soon brought under control. To date not a single case of typhus has been reported among American troops in Italy. We are confident, therefore, that armed with a vaccine which is probably protective, and DDT louse powder, the effectiveness of which is little short of miraculous, we need no longer fear typhus fever in the U. S. Army.

We know that the seeds of typhus have been planted throughout many parts of Europe. Therefore, unless prevented, the disease will be carried back to their devastated homelands by returning refugees and displaced populations after the war. Anticipating this, the Typhus Commission and the Civil Public Health Division of The Surgeon General's Office have planned, and are ready to inaugurate, a great program of delousing and vaccination among these miserable and homeless individuals. This is a gigantic undertaking as there are probably 18 million people to be handled. However, we are convinced that by this method we can prevent another great series of post-war epidemics.

PROGRESS IN THE FIGHT AGAINST OTHER INSECT-BORNE DISEASES

Not only have our new insecticides enabled the Army to control typhus, but they have assisted materially in its fight against malaria, which is the number one hazard

in all of our tropical theaters. It is easy enough to prevent malaria under the stabilized conditions which exist in this country by instituting the proper type of permanent mosquito control. This has been done, and our rates among soldiers in the United States are the lowest ever recorded in the history of the Army. Under combat conditions, however, there is no time for such control, and we must rely on nets, protective clothing, insecticidal sprays and mosquito repellents to prevent malaria, and upon the administration of such drugs as atabrine to suppress symptoms in those who contract the infection.

Fortunately our entomological collaborators have provided us with excellent sprays and repellents. At first pyrethrum, which is lethal to both adult and larval mosquitoes, was used in an oil spray, but the usefulness of this preparation was limited by the fact that it fell rapidly out of the air. Early in 1942, scientists of the Department of Agriculture found that when pyrethrum is combined with the inert gas, freon, it can be discharged in very small particles in the form of an aerosol which remains in the air for several hours. After overcoming many manufacturing and supply difficulties, this combination was finally incorporated in the one-pound Army mosquito bomb which does the work of a gallon of the old type oil spray. The spray from this bomb, if released for only 4 seconds, will kill all the mosquitoes in a small bedroom of 1,000 cubic feet. The spray from the whole bomb, released for 15 minutes, will kill all those in 56 large living rooms, or in 225,000 cubic feet.

The first deliveries of the mosquito bomb were made

to the Army in November 1942. After field tests had shown it to be effective, an allowance of 150 bombs per thousand men per month was authorized for highly malarious areas overseas. Since that time this allowance has been doubled, and has reached the maximum which can be supplied with the limited amounts of pyrethrum in this country. The bombs are used to kill adult mosquitoes in barracks and other buildings, in tents, in foxholes and in dugouts. They are also used in native villages near troop installations, which ought to be sprayed once a week to reduce the reservoir of infected mosquitoes. Because of the shortage of pyrethrum which followed the failure of the crop in Kenya, the bombs have not been used in this country, except for the disinsectization of planes returning from foreign areas, and for the training of troops in malaria control methods.

Although the most important use of the pyrethrum bomb is for the destruction of anophelines, it is also effective against other mosquitoes which transmit yellow fever, dengue fever and filariasis, and against the sandflies which carry leishmaniasis, sandfly fever and oroya fever. Its wide success has led to the hope that DDT can be incorporated into a similar bomb, and developmental work on this project is in progress.

REPELLENTS

Our research collaborators have also given the Army a series of highly effective insect repellents. Before the war we were using oil of citronella and various inadequately studied proprietary preparations, which were usually ineffectual, often unpleasant and sometimes actually dangerous if applied to the skin over a long period of time. After some months of investigation, our advisers recommended three substances, namely indalone, Rutgers 612, and dimethyl phthalate. The first Army deliveries of these repellents were made in November, 1942, and quantity shipments overseas began in January, 1943. They were used in enormous quantities in malarious areas, and Army investigators working on sandfly fever in North Africa and Sicily, and on oroya fever in Peru, soon found that they were also extremely useful against the sandflies that carry these diseases. In fact, they give longer protection against sandflies than against mosquitoes. As indalone is most effective against flies, "612" against aedes mosquitoes and dimethyl phthalate against anopheline mosquitoes, the three preparations were later combined, and at present this mixture is the standard Army repellent. Three 2-ounce bottles are issued to each man every month in the most malarious areas. The repellent effect of this mixture lasts from three to eight hours.

In certain localized regions of the Southwest Pacific and of the China, Burma and India theater, scrub typhus has been an annoying problem, and has caused a mortality of from 3 to 10 per cent. Fortunately dimethyl phthalate, when used to impregnate clothing provides protection against the mites which transmit the disease. Clothing and blankets are treated before troops enter areas in which they may be exposed to scrub typhus.

Treated uniforms are marked with a large X on the back of the jacket in order that a quick check can be

made to be certain that all men are wearing protected clothing.

Recently, an example of the effectiveness of repellent-treated clothing in preventing scrub typhus was afforded by the experience of three patrols which operated successively in the same area where risk of infection was high. The first group did not have treated uniforms and 53 cases of scrub typhus subsequently occurred. In contrast, a second patrol of equal strength to the first, wore impregnated clothing and not a single case of the disease was contracted. Later, another patrol which neglected to use repellent entered the same area and subsequently developed 23 cases of scrub typhus. Such an experience dramatically emphasizes the value of our new repellents in preventing disease when rigorously employed.

LARVICIDES

Until recently, the mosquito larvicides used in the Army have been limited almost entirely to oil and paris green. The researches of the last year have shown, however, that DDT dissolved in oil, is much more effective than anything formerly used, even when used in infinitesimally small amounts. DDT is now employed for mosquito control in all of our tropical theaters. Use of DDT for larvicide permits great saving in time, effort and materials as well as providing increased effectiveness.

The demands of the louse control program completely absorbed all of the DDT produced last year and the early part of this year. It is only in recent months that DDT in large quantities has reached the oversea theaters for use in mosquito control. However, dramatic results have already been obtained.

Shortly following the invasion of Saipan an epidemic of dengue fever occurred among the troops employed in the operation. In addition to other measures for mosquito control, DDT solution was used extensively as an insecticidal spray disseminated by power sprayers on the ground and from airplanes flying over large areas where troops were operating. These procedures resulted in an immediate reduction of larval and adult mosquitoes and of the fly population as well. Within two weeks after the control program was started, daily admissions of new cases of dengue fell more than 80 per cent and the epidemic was soon under complete control.

DDT RESIDUAL SPRAY

One of the most remarkable properties of DDT is its long lasting effect when sprayed inside of buildings. A 5 per cent solution of DDT in kerosene sprayed on interior surfaces leaves a residue which kills insects lighting on the treated areas for a period of several months. This usage offers great promise for malaria control, especially when applied to the habitations of native carriers where infected mosquitoes lurk. Destruction of infected adult mosquitoes constitutes the most effective break in the chain of malaria transmission. Thus, DDT residual spray affords a simple method to reduce malaria even in poverty-stricken tropical regions where the disease has long held unbroken sway.

The residual effect of DDT is also effective against other insect disease vectors. It has been employed successfully to control the sandflies which transmit sandfly

fever and leishmaniasis. In Dakar where an outbreak of plague recently flared up in the civilian population, DDT was sprayed in the native houses to kill infected fleas which had left the dying rats. This procedure was considered a helpful adjunct to the usual rodent control measures.

Fly control is highly important to the Army as a means of preventing dissemination of dysentery and other enteric infections. DDT is particularly effective against flies, both as an agent to kill the adult insects and to prevent fly breeding in pit latrines, and refuse dumps. Flies have small chance of surviving in mess halls and kitchens which have been treated with DDT. Spraying of garbage racks and other places where flies are attracted is also useful in keeping down the population of this mechanical vector of disease organisms.

The nuisance of bedbugs, cockroaches and other pest insects can readily be eliminated by DDT. Solutions sprayed on beds, mattresses and the walls of barracks maintain their effectiveness for several months. After the war, DDT will be a great boon to households where pest insects frequently are troublesome.

Like other powerful insecticides, DDT has an inherent toxicity to other types of life. Fortunately, if applied in proper amounts, it is harmless to fish, water fowl and domestic animals. However, people must observe certain precautions in using DDT. In oil solution, it may be absorbed through the skin and produce toxic effects. Therefore, care must be taken to avoid prolonged contact with oil solutions or clothing on which they have been spilled. DDT may also be harmful if ingested in any considerable amount. The powder is odorless and colorless, and precautions must be observed to prevent accidental contamination of foodstuffs. Otherwise, DDT can be used with safety in a wide range of insecticidal applications.

FUTURE POSSIBILITIES OF DDT

In the short period of three years, the scientists of this

country have forged many new weapons which the Army is using successfully in its war against insect-borne disease. The greatest of these weapons is DDT. It has enabled us to control typhus fever in Naples, and affords better protection than any other substance yet developed against the mosquito vectors of malaria, yellow fever, dengue fever, and filariasis. Its full potentialities for use against the insects which spread still other important diseases have not yet been determined, although laboratory and field investigations have been speeded up, and the help of additional agencies enlisted to study this important chemical. Because of its toxicity, it is essential to know the effect of DDT not only on disease-bearing insects, but also on insects which we wish to preserve, such as bees and the useful species which assist in the pollination of crop. It is also important to know what action it may have on various forms of plants and wild life animals. All of these subjects will be studied by a new Insect Control Board which is being formed by the Committee on Medical Research of the Office of Scientific Research and Development. In the meantime, the demands for DDT have become enormous. The War Production Board has done a wonderful job in developing a new industry for its production within a remarkably short time. However, as production mounts, so do the requirements, both military and civilian, of the United Nations.

There is still much to be learned about DDT, but we already know that the Army can use it for specific purposes, and that when properly used, it produces miraculous results. I feel quite sure that the knowledge gained of this amazing chemical, constitutes the most valuable single contribution of our wartime medical research to the future health and welfare not only of this nation, but of the world. The development of the Army's new weapons against the insect vectors of disease affords another example of the effective way in which the medical profession of the United States has cooperated with the armed forces in winning the war.

Achievements in Environmental Sanitation

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ENVIRONMENTAL sanitation, in modern public health practice, embraces a wide range of activity directed toward the control of communicable disease and other ill effects associated with a faulty environment. Preventive measures that are being applied seek to exclude, control or destroy the infectious or damaging agent at its source or to intercept its spread by such vectors as water, food, air, insects, animals, etc.

In routine public health work, environmental sanitation usually includes activities that are directed toward safe-

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guarding domestic water supplies, insuring the proper disposal of sewage and other wastes, controlling the pollution of lakes and streams, protecting public bathing places, eliminating the dangers associated with the production, processing, distribution and dispensing of foods, preventing occupational hazards, providing proper housing facilities, controlling atmospheric pollution, and destroying insects and animals that are implicated in the transmission of disease.

Since engineering principles are usually involved in the application of remedial measures to faulty environment, the sanitary engineer, and the more recently defined pub-

lic health engineer, play a very important professional part. The most effective control measures have, nevertheless, been brought about through the efforts of all the professional groups concerned with the solution of environmental problems, and among those who have made significant contributions are the bacteriologists, entomologists, biologists, parasitologists, epidemiologists, chemists, geologists, physicists, sanitarians, veterinarians, and statisticians.

The control of man's environment for the protection of public health was one of the very early endeavors in public health work; yet the development of measures of control was comparatively slow up to the beginning of the present century. Filters were used for the removal of turbidity from water in London, England, as early as 1829 but it was not until about 1855—when bacteriological methods were developed which gave some indication of their effectiveness in removing bacteria—that the hygienic significance of filters came to be appreciated. From that time on, progress was made not only in improvement in the design of filters but also in their operation, by combining chemical treatment with filtration, to aid the removal of objectionable physical, chemical, and biological characteristics of water. About 1908, the use of chlorine as a disinfecting agent for public water supplies, both with and without filtration and with other chemical treatment, was begun in this country, and this added greatly to the effectiveness of the water treatment process in preventing water-borne disease. The modern water purification plant has now been so perfected in design and operation that objectionable properties of water can be effectively removed under a wide range of conditions, and the organisms which cause the common water-borne diseases removed, destroyed or rendered innocuous.

There is one problem, however, in water purification which has been of much concern to public health engineers, and that is, whether modern water purification processes are effective in removing or destroying the cysts of *endamoeba histolytica* in drinking water. This problem has attained greater significance since our armed forces have been sent into parts of the world where this form of amoebic dysentery is common. Consequently, extensive research has been going on in testing the effectiveness of various kinds of filters and chemicals in the removal and destruction of amoebic cysts in water, and mobile field equipment and practical operating methods have been developed for use in this connection. One of the results has been the substitution, in small filters, of diatomaceous earth for sand, the medium ordinarily used as a filter in water purification processes. The small filters—in which this substitute for sand is used—have reduced very materially the weight of mobile equipment, and are equally, if not more, efficient in the removal of amoebic cysts and other pathogenic organisms.

Experiments with a number of chemicals have also been conducted recently in an attempt to discover one that will destroy all of the known disease-producing organisms in water and still leave the water potable for man. Very encouraging results have been reported on these researches.

At the present time, there is little excuse for the existence of unsafe water supplies in so far as the common water-borne diseases are concerned because standards recommended by health authorities for the location, construction and operation of both surface and ground water supplies, and for the distribution of all supplies, are now available that will safeguard such installations.

Another public health problem that is closely associated with water supplies is that of the introduction of disease-producing organisms into drinking waters by means of incorrectly designed and improperly operated plumbing systems and plumbing fixtures. The significance of plumbing in the protection of the public health was forcefully brought to the attention of the people in this country by the outbreak of amoebic dysentery which occurred during the World's Fair in Chicago in 1933. This outbreak, which resulted in about 1400 cases and nearly one hundred deaths among the guests and employees of two hotels, was traced to defective plumbing through which sewage was permitted to flow directly into the drinking water supply. Some of the older types of plumbing fixtures, particularly, are so designed that under certain favorable conditions, sewage may flow or be siphoned into the water supply or into various fixtures that are connected to or are a part of the plumbing system. The fixtures with dangerous connections have even included such equipment as sterilizers for surgical dressings and instruments in hospital operating rooms.

Plumbing standards have been promulgated which should eliminate substantially all of the known defects in plumbing installations, but rapid developments in design and installation of plumbing systems and fixtures necessitate constant vigilance on the part of public health officials if the introduction of new hazards is to be prevented.

The disposal of sewage and industrial wastes is still one of the most important problems in environmental sanitation. Of major concern is the disposal of untreated sewage and wastes into streams and lakes used as sources of public water supply, and which often seriously interferes with the operation of water purification plants. Modern sewage disposal practice has developed to a point where treatment plans can be designed and constructed to meet the needs of most situations; nevertheless, the United States Public Health Service, in a recent survey in the United States, finds that additional sewerage or sewage treatment facilities are needed in 13,915 of the 16,752 communities included in the survey. There has been some tendency toward the development of complicated mechanical methods of sewage treatment which require very exact plant operation to produce satisfactory results; this has worked to the disadvantage of small communities where technically trained operators are not usually employed. Some consideration is now being given, however, to simplifying the treatment process.

In general, when all phases of the utilization of the public waters are considered, such as their use for the maintenance of wild life or live stock, for recreation, industry, etc., industrial wastes constitute the greatest source of pollution of the lakes and streams. Many industrial wastes are much stronger than domestic sewage

in their ability to deplete the oxygen in receiving waters. In fact, some of them are a hundred times stronger than domestic sewage when measured in terms of oxygen demand. While considerable progress has been made in the disposal of industrial wastes both in their economical utilization within the industry and in the development of satisfactory treatment methods for their disposal, there is still a great deal to be done toward working out a satisfactory solution of the proper disposal of wastes for many industries.

Probably the weakest part of many water pollution control programs in this country is the lack of legal authority, administrative machinery, and technical facilities, for the supervising agency to protect all the interests concerned with water uses. The public is becoming more aware of the serious damage to public waters that is caused by indiscriminate pollution, and progress is being made toward developing effective federal, state, and local control programs.

Public bathing places, including bathing beaches and swimming pools, have become an important part of our system of physical education and recreation, and the expansion of these facilities in the past decade has brought to the attention of public health officials some new problems. In addition to the common inflammatory diseases of the eye, ear and throat, and some infections of the gastro-intestinal tract, other disease conditions have frequently been traced to bathing places. There has been an increase in the number of outbreaks of schistosome dermatitis (swimmer's itch) reported from recreational areas in recent years. In fact, the situation became so acute in some states that studies were made on methods for the destruction of the snails that harbor the cercariae of the schistosome larva in an effort to eliminate the source of infection. Copper salts, especially copper carbonate, appear to be effective when applied to the infested area by means of proper equipment and under technical supervision. Another infection, very commonly associated with bathing places, is "athlete's foot," a condition which is very difficult to control. The chemicals which have been used for destroying the fungi that cause this infection have not proved to be very efficacious, and there is a definite need for research on other fungicides and on methods of applying them, both to the persons affected and to the facilities and equipment which they may contact. Definite standards have been advanced by health authorities for the protection of bathers at swimming pools but in order to determine more precisely just what part public bathing places play in the transmission of communicable diseases (especially infections of the respiratory tract), further epidemiological studies should be made.

The supervision of establishments where food and drink is processed, prepared, handled, served and sold to the public is another activity of importance in environmental sanitation. The many food-borne epidemics that have occurred in the United States in recent years is strong indication that there is need for improved sanitary practices in the food industry. State health departments, in 1942, reported to the United States Public Health Service 245 food-borne outbreaks, involving near-

ly 12,000 cases and 101 deaths. These figures, however, represent but a small proportion of outbreaks which occur, and undoubtedly do not include many cases of intestinal disturbances of short duration in persons who do not consult physicians, whose cases go unnoticed and are not reported to a health department.

Significant advances have been made in the development and application of protective measures in the production, processing, distribution and dispensing of foods. Among them are improved refrigeration, scientific control of food canning, quick freezing of foods, dehydration, and the use of improved cleaning compounds and sanitizing agents. Likewise, outstanding advances have been made in the processing of milk and dairy products. Pasteurization equipment is now being built on sound engineering principles which make it possible to carry out the process with assurance that the common communicable disease organisms that may be transmitted through milk are destroyed. The control of bovine tuberculosis, and an expanding program for the control of Bang's disease, are outstanding examples of disease prevention in veterinary medicine.

Still another approach to the control of food-borne disease is the supervision of sanitation and food-handling practices in public eating and drinking establishments. The United States Public Health Service has inaugurated a nationwide program in cooperation with the states to bring about improvement through the passage of adequate ordinances, carefully conducted inspections, and surveys, the grading of establishments on the basis of sanitary compliance, and the education and instruction of food-handlers in sanitary methods of handling food.

Another recent advance in food sanitation is research undertaken with the view of eliminating health hazards resulting from incorrect design, construction and operation of food handling equipment. Engineering and laboratory studies on restaurant equipment such as dish- and glass-washing machines, hot water heating equipment, food dispensing apparatus, refrigerators, food mixers, etc., have already led to improvements which will materially aid in safeguarding health by promoting better sanitation.

One of the important problems of our present social and economic life, and one which has strong public health implications, is housing. In recent years various branches of our Government and many private organizations and agencies have directed a good deal of attention to the study of housing conditions, including the preparation of standards for healthful housing, of survey techniques for ascertaining the condition of existing housing, and the actual construction of housing projects. In housing developments, the problems of water supply, sewage and waste disposal, plumbing, ventilation, heating, lighting, refrigeration and air conditioning, are familiar, but with the anticipated innovations in the construction of dwellings intended to provide greater efficiency, comfort and convenience, there will undoubtedly be many other problems. In the modern home, there will be household equipment that is attached permanently, or temporarily, to the plumbing system, and through which it may be possible for sewage or other contamination to flow, or be

siphoned back into the drinking water system. To illustrate, one piece of equipment that has recently appeared on the market is a mechanical device that can be attached to a water faucet for flushing sinks and toilet fixtures. This device, when connected, provides a direct cross connection between the water supply and the sewerage system of the dwelling. These comparatively simple devices in a private home constitute a problem quite apart from the more complicated sanitary situation involved in large housing structures and in industrial establishments, where many people live or work in limited space in a highly mechanized environment. Whether it is the simple rural dwelling or the carefully zoned urban area with its public utilities and services, housing will always give rise to problems in sanitation for the public health engineer.

The control of atmospheric pollution, whether such pollution is caused by substances such as gases, vapors, dust, smoke, or viable pathogenic organisms, have always been a problem to public health workers. A vast amount of research has been undertaken on the control of gases, vapors, dust and smoke in connection with industrial hygiene, and considerable study, especially in recent years, has been given to the environmental control of air-borne infection, with its associated problems in bacteriology, epidemiology and engineering. Outstanding progress has been made by industrial hygienists in developing methods for the control of poisons, irritating gases and vapors, and suspended particles in air, but less definite information is available on the environmental control of air-borne infection. Present-day researches on air-borne infection have been directed mainly to three general methods for the removal or destruction of pathogenic organisms in the air, namely, chemical sterilization, ultraviolet radiation, and dust control. For many years, attempts have been made to sterilize air by means of chemicals, beginning with the early work with sodium hypochlorite and extending to the more recent researches on the glycols. At present, the effectiveness of the glycols, particularly triethylene glycol, is being investigated as a sterilizing agent for air. The chemical is introduced into the air in very small quantities by means of vaporizing or atomizing equipment, and a number of factors such as relative humidity, temperature, and dust, appear to influence its effectiveness. In addition to the basic experimental work on this chemical as a sterilizing agent, considerable progress has been made in producing automatic mechanical equipment for administering the chemical and, at the same time, controlling the relative humidity of the air in the space under treatment. While the situation with respect to the glycols is hopeful, further investigation is necessary before the degree of their effectiveness can be established as a practical means of controlling air-borne infections in enclosed spaces.

Ultraviolet sterilization of air is being tried with some success, but there are several practical difficulties that must be overcome before this method gains wide acceptance. One of the drawbacks is the possibility of damage to the eyes. To reduce this possibility, indirect radiation systems have been proposed which sterilize the upper stratum of air, and recent tests show that this method

must be supplemented by floor radiation to sterilize the lower air stratum and the dust.

The control of dust (including lint) appears to play a significant part in the dissemination of bacteria and viruses in air. Experiments conducted in hospital wards have demonstrated that simple methods of dust control, such as oiling floors and treating bed clothes with oil emulsions to minimize the dispersion of dust and lint, do very substantially reduce the bacterial content of the air. Further researches on the effectiveness of this method, both alone and in combination with air sterilization, and its practical application are now in progress.

Interest in the control of insect vectors involved in the spread of diseases in man was greatly increased during the present war when it became known that our armed forces would be sent to parts of the world where insect-borne diseases such as malaria, typhus fever, dengue fever, and filariasis, would be encountered. The most outstanding advance in the control of insects has been the use of the chemical dichloro-diphenyl-trichloroethane (commonly known as DDT) as an insecticide. This chemical has extraordinary power to destroy a great variety of insects, including mosquitoes, lice, fleas, flies, etc. It has been used extensively and effectively by our military forces for the destruction of the various species of the anopheline mosquitoes that spread malaria, and the lice that spread typhus fever. Methods for administering the chemical in its many uses have been developed, ranging from its direct application to the human body as a powder for the destruction of lice, to spraying as an oil mixture from aeroplanes over wide areas for the destruction of mosquitoes. The powder was used effectively for delousing in the control of typhus fever in Naples when Naples in Italy was invaded in 1944, and it has been shown that the oil-spraying method has a devastating effect on mosquitoes. Progress has also been made in the discovery of new repellants that can be used as temporary expedients against the attack of insect vectors.

Of the rodents involved in the spread of disease in this country, the rat is the most important. Its association with plague outbreaks in the past, and with the spread of typhus fever, are well known. Endemic typhus fever, which was found in the southeastern states as early as 1913, has had a tendency to spread inland from the Atlantic and Gulf states, and more recently an appreciable number of cases have been reported in southern Texas. Investigations of the United States Public Health Service have indicated that the rat is also involved in the spread of trichinosis. To say the least, the rat as a disease vector constitutes a serious potential health hazard, and effort should be made to control its ever increasing numbers in this country. Methods of rat control are well known, and include such measures as rat proofing of structures, removing harborages and breeding places, the sanitary disposal of garbage, and poisoning and trapping. The most effective of these is the elimination of food and harborage, mainly a public health engineering problem. In addition, research has been undertaken on rodenticides, especially those most potent to rats, in the hope of improving their effectiveness as an adjunct to a more complete rat control program.

To summarize the situation, definite progress has been made in the control of environmental factors that influence the public health, the results of which are reflected by the marked reduction in the incidence of certain communicable diseases that are susceptible to such control measures. For example, there were 688 deaths from typhoid fever in Minnesota in 1910 whereas in 1943 there was only one death. This decline is mainly the result of the protection of water supplies, the increased use of pasteurized milk, and the detection and supervision of typhoid carriers.

Standards now in use by health departments for safeguarding water supplies (including standards for plumbing) should, if properly applied, eliminate water as a factor in the spread of the common water-borne diseases in this country. It is anticipated that new water disinfecting agents will be developed that should be effective for all the known water-borne diseases. The application of recognized methods of sewage and waste disposal would add materially to the permanent safety of water supplies by reducing the bacterial loading on water purification plants and would also benefit other interests concerned with the utilization of public waters.

Public bathing places are now amenable to some degree of environmental control but further epidemiological and public health engineering investigations are necessary in order to determine their relationship to certain communicable diseases and to develop methods for the control of all the diseases associated with such places.

Food sanitation, including the problem of sanitation of eating and drinking establishments, must be given more attention if the large number of disease outbreaks reported each year are to be controlled. Special studies should be made of the public health engineering problems involved in the design, construction and operation of equipment used in the processing, handling, storing,

and dispensing of foods.

Housing is beginning to take a more prominent place in health department activities, and advances have been made in developing principles and standards for housing projects, and in survey techniques for appraising existing housing.

Environmental control of air-borne infection by chemical sterilization, ultraviolet radiation, and reduction of dust content of air, is being studied and some encouraging results have been obtained. If the effectiveness of these or other methods is established on a practical basis, another approach will have been made to the control of respiratory diseases. Methods and techniques for the control of insect vectors have produced spectacular results with the use of new insecticides.

The background of experience in rodent control, particularly with respect to rats, has resulted in well-established methods for their control, but unfortunately progress in their application has been comparatively slow.

These, in summary, are some of the achievements of environmental sanitation, and it is significant that they are achievements which in turn present problems for continued work. No doubt the greatest retarding factor in the field of environmental sanitation is that practical control measures that are well known are often not applied. This is an aspect of the subject to which public health workers must strongly direct their attention; its implications to them are quite clear. On them falls the duty of translating new knowledge into tangible and effective controls, and securing the cooperation that will maintain such control effectively. Further progress will be brought about largely through the development of federal, state and local public health services, provided with trained personnel and other facilities, and through the coordination of these services with a program of public health education.

Global Epidemiology

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DISEASE, a phenomenon that in former years has been one of the most local and personal of all matters, has today acquired global stature. No longer can a community or a nation think of public health solely in terms of its own problems. Social, economic and political changes of recent years have so broken down the barriers of distance that disease problems of one nation are today of vital concern to nations on the other side of the globe. We can no longer view with mere academic interest the diseases of the interior of Africa, of the Orient, or of isolated Pacific isles. Conditions that were formerly exotic curiosities to American medicine, and terms that were mere tongue-twisters to

the medical student, have thrust themselves on our consciousness and are matters of everyday concern to American physicians in some parts of the world. In the expanded travel of the postwar world these same diseases will constantly thrust themselves before us and demand that we take more than polite notice of them. We must, from selfish necessity, become our brother's keeper in matters of disease control.

But this will require certain changes in our point of view. Most of our current concepts of epidemiology are essentially local. Although the epidemiologist has usually prided himself in having at least an academic interest in certain diseases of distant lands, yet this interest has been in the local factors that conditioned the occurrence of the disease. That his interest should have been so limited was both logical and inevitable so long as these diseases

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remained essentially local phenomena. This was due very largely to transportation limitations supplemented by the relatively effective maritime quarantine measures. Oceans have interposed barriers that were not readily crossed either by victims of disease or by vectors. A person infected in the Philippines with dengue or any other disease in which the incubation period and the period of communicability were short would not reach Hawaii until after the danger of transmitting infection had passed. Similarly a patient infected with cholera before his departure from India would not reach California or western Europe before the development of symptoms which would make possible his detection by maritime quarantine procedures. The *Anopheles gambiae* of Central Africa, probably the most serious of all malaria vectors, did not formerly cross the Atlantic or the Mediterranean, nor did it jump the deserts of northern Africa. A combination of slow transportation supplemented by effective quarantine measures had sufficed to limit sharply the distribution of certain diseases.

It is necessary to emphasize at this point that mere distance sufficed to limit the spread of certain diseases whereas other diseases such as cholera were notorious international marauders that periodically broke loose on a rampage of destruction until effective maritime quarantine kept them within bounds. The Pacific Islands present one of the best examples of protection through isolation and slow transportation. Malaria has failed to establish itself in a tremendous area of Oceania in spite of a complete absence of protective measures. The line of demarcation between those islands in which malaria is rampant and those free of anopheline mosquitoes (and therefore of malaria) is drawn west of the Philippines, thence eastward to the north of the Dutch East Indies, New Guinea and the Solomons, thence southward to the east of New Hebrides and west of New Caledonia and New Zealand. All the islands east and north of this wandering line are free of malaria.

The only satisfactory reason that can be offered for this phenomenon is that of distance and slow transportation, not quarantine. While it is true that certain of the atolls offer breeding conditions hardly suitable for the perpetuation of anopheline mosquitoes, so simple an explanation can hardly explain the absence of anophelines from New Caledonia or the Fijis. There is nothing about the terrain, the soil or the water of New Caledonia that should prevent anopheline breeding were the mosquitoes to effect the passage from New Hebrides. It is very possible that malaria and the anophelines have migrated eastward along New Guinea through the Solomons to New Hebrides and that we are now observing an interlude before an effective jump to New Caledonia or Fiji—a jump that would have occurred in some future period if control measures had not been established. Certain it is that until very recent years no effective measures have been taken to guard against such a spread to many of the Pacific Islands.

It would of course be very comfortable to believe that diseases of the future will maintain their fixed geographic distribution. Unfortunately, however, bitter experience has shown that such is not the case. Bubonic plague and

cholera have repeatedly swept across Europe. The latter crossed the Atlantic at least three times during the last century and created disastrous and widespread outbreaks in the United States. Against these diseases effective maritime quarantine measures have been established, measures which appear to have been effective so long as transportation was confined to the slow plodding of ships.

The introduction of the airplane has, however, completely altered the international disease problem and has required that epidemiology be viewed with a global perspective. Not only have distances been bridged within a few hours, but new bridges have been built to link areas that formerly were unconnected. Areas that formerly had no concern with each other's welfare have today become fellow sufferers from disease problems that they share with each other.

This lowering of the barriers of distance already has had its effect on the distribution of disease. Eastern Brazil had formerly little connection with its nearest neighbor to the East, viz., western Africa. The mere fact that the path between these two areas was the shortest distance across the Atlantic was of no importance as the ship routes were determined by commercial rather than geographical interests and therefore led to Europe or North America. The presence of *Anopheles gambiae* in Africa was therefore of mere academic interest to Brazilians until direct rapid transportation brought the species to Brazilian shores. The disastrous malaria epidemic that ensued will not soon be forgotten in Brazilian medical circles, nor even in peasant lore of that section that was the unhappy victim. That the disease was brought under control, was confined to a small area of eastern Brazil, and that the gambia mosquito was ultimately completely exterminated from the western hemisphere constituted one of the most significant and dramatic episodes of public health history. One shudders to think what would have been the consequences of failure to control the spread of the gambia mosquito from its beachhead in Brazil. Had it become widespread throughout those parts of the western hemisphere in which it found suitable breeding conditions, the loss of life would have been appalling and a vast area would have experienced an economic setback from which it would probably not have recovered for over a century, if at all. Today Egypt watches with no small apprehension the menace of gambia along the upper Nile and the attempts being made to check its progress toward the densely populated delta regions.

One other example will suffice to indicate the importance of the global concept of epidemiology. A few years ago we believed that we could almost see the ultimate eradication of yellow fever. As we saw the foci in South America dwindling with each passing year we looked forward to the time when we could truly speak of an extinct disease. The discovery of jungle yellow fever and the recognition of its widespread occurrence throughout South America and Central Africa not only shattered our hopes but also pointed out a serious potential threat to other parts of the world. At the same time it raised the question as to the reason why yellow fever had not already spread to the Orient in spite of the widespread

occurrence of suitable vectors in India and southeastern Asia. For lack of a better explanation we have fallen back on the hypothesis of distance and chance, though neither prevented the spread from Africa to America or vice versa. The fact is that we do not yet know why yellow fever has failed to spread from Africa to India and the Orient whereas dengue, which is spread by the identical mosquito and has comparable periods of communicability and incubation, has so spread.

On the less favorable side of the ledger we may note the world-wide spread of influenza. The 1918 pandemic was neither the first nor the last of these episodes. There is no reason to believe that its origin or spread was in any way associated with the war though few would deny that the conditions of war increased the number of deaths. Since 1918 we have observed repeated spread of influenza from one part of the globe to another, even though these recent pandemics have not been attended with comparable case fatality rate. New methods of virus research have revealed the identity of the disease as it has appeared in the various corners of the earth. How it may have spread from one continent to another we do not know other than to suppose the very simple and in many respects hardly adequate concept of migration through persons ill with the disease. The significant fact is that influenza has so spread and that no barrier that we have so far devised has had the slightest effect on limiting or slowing its spread.

These few examples will suffice to illustrate some of the disease migrations that have and have not occurred and our lack of satisfactory explanation for these phenomena. At the present moment certain persons are apprehensive that the termination of the war will witness even further spread and that troops returning to the United States will bring in new diseases which will become established on this continent. For reasons too numerous to discuss here I do not believe that the mere return of troops will open the doors to epidemic invasion. From the standpoint of self-interest the United States is probably less concerned with the global aspects of disease than is almost any other nation. Our location, our climate, our sanitary culture and economic advantages give us many barriers not possessed by other less fortunate nations or islands. We have seen the migration of malarious persons to our shores without attendant increase in malaria hazards. Our standard of sanitation is such that cholera, even if introduced and beginning as a localized epidemic, will not flare up as a nation-wide conflagration such as was experienced by our great grandparents during the middle of the last century.

Other nations are not likely to be so fortunate in the vast migration of population that will follow the cessation of hostilities. The end of the last war was the signal for some of the most extensive outbreaks of typhus and malaria that the world has ever known. While our

armamentarium against these two diseases is vastly improved and may prevent or minimize a repetition of such disasters, we cannot feel that they are equally effective against all diseases, or equally effective against these two diseases in all parts of the globe. No one can foretell the disease problems that may be created in certain parts of Asia, though we can all shudder at the thought of the potentially serious consequences. Certain it is that we cannot minimize the risk by merely ignoring it.

From the standpoint of pure science and the vital interest that all nations must henceforth have in their neighbors' welfare, it is essential that we must take future cognizance of the global aspects of epidemiology. The science of epidemiology is one of the newer disciplines of medicine, so young in fact that few basic principles and laws have as yet been established. We have been groping at an explanation of the occurrence of disease within a limited group of people; i. e., local epidemiology. The mere use of the term "endemic" to refer to the existence of a disease within the people of a given locality has expressed our almost tacit acceptance of a fixed geographic distribution for which we did not always seek an explanation. Most of our attention has been devoted to the study of the distribution or temporal fluctuations of a disease within a small population group. This has been important and has yielded much valuable information that has been put to effective use in our public health programs. The time has now arrived, however, when we must concern ourselves with the broader geographical aspects of epidemiology.

By this I do not mean the mere preparation of maps to show where a disease occurs. This is an important preliminary upon which mere beginnings have been made, for basic data regarding many diseases in many areas are sadly lacking. For example, we are only beginning to learn the distribution of scrub typhus. More important than mapping, however, is a study of the underlying reasons why a disease does or does not occur in a given locality. To cite a very simple example, we do not understand why diphtheria as a clinical entity disappears as we approach the tropics even though the infection with the *Clostridium diphtheriae* as manifested by positive Schick reactions, is widespread.

The field of global epidemiology remains to be tilled. So far only a few experimental plantings have been made, enough only to show that a rich harvest can be expected in the field if properly cultivated. From such cultivation we may expect not only to add to our knowledge as to the factors governing the spatial distribution of disease, but through such understanding to learn also more about the reasons underlying the occurrence of disease within a given locality. At the same time we may uncover data of tremendous significance in the battle that lies ahead to prevent the spread of disease to new areas. No other field of epidemiology offers today such prospects of a rich harvest.

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The Control of Disease by Means of Immunization

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MOST procedures for the control of infectious disease are fairly well understood. Quarantine, filtration of water, pasteurization of milk — even the prophylactic use of sulfonamide drugs — all act through mechanisms which can be defined in fairly exact physical or chemical terms. No such precise basis is yet available for defining the effects produced by immunization. Indeed, were Edward Jenner to return to an earthly existence today, 148 years after his first performance of vaccination, he might chide us for our dilatory progress in unfolding the secrets of the phenomenon which he disclosed to the world. But Jenner was far ahead of his time. It is surprising how long an interval elapsed between the discovery of smallpox vaccination and the next application of this principle in 1880, when Pasteur discovered a method for preparing a vaccine against chicken cholera. Almost another three-quarters of a century has passed since Pasteur's extension of Jenner's principle. In that time the methods for controlling infections by immunization have ramified tremendously, not only in the number of diseases to which immunization has been applied, but in the ways of preparing vaccines, using them and evaluating their results. With this expansion of practical knowledge concerning immunization there has developed an increased understanding of its behavior, its possibilities, its limitation, and of the ways in which its applications may be most successfully explored in the future. Knowledge of immunization is now in fact moving ahead so fast that a review of the subject is in danger of suffering from distortion somewhat like that which one used to see in photographs of racing automobiles. The photograph nevertheless had its value; and it is with similar reservations that this discussion of immunization is presented.

Two kinds of immunization are commonly referred to — active and passive immunization. The two are still so often confused that, at the risk of tedious repetition, it may be advisable to re-emphasize the distinction. Active immunization consists in the injection of killed or attenuated bacteria or viruses, or extracts of these organisms, in such fashion that the blood and tissues of the individual injected develop a resistance to the organism or to its poisons. Even though the total dose of material injected be very small, it may produce effective resistance against the most virulent form of the actual disease in question. This is the fundamental principle employed in all forms of vaccination. Jenner's smallpox vaccine and Pasteur's rabies vaccine consisted of attenuated virus, whereas killed bacteria have been employed by Haffkine against plague, by Wright and by Russell against typhoid fever, and by many others against various other diseases.

Passive immunization is based upon the discovery that the blood serum of actively immunized animals or hu-

mans contains "antibodies" against the organism used in immunization. By injecting this serum into a susceptible individual freshly exposed to the infecting organism, the disease may be averted. The effects of passive immunization are immediate, whereas those of active immunization do not appear for days, weeks, or in some cases months after injection. Active immunization, however, is developed within the body itself and hence is in a sense permanent, whereas passive immunization is borrowed, so to speak, and produces no such response in the body so that the effects wear off in a few weeks.

By far the most important of the two forms of protection is active immunization, not only because of its far greater duration but because it is effective in a greater variety of situations. In discussing the applications of immunization to preventive medicine, therefore, the emphasis will be on active immunization, particularly as it applies to the prevention of smallpox, diphtheria, typhoid fever, and tetanus.

Smallpox. Without any doubt, smallpox vaccination has been one of the most extraordinary life-saving discoveries in the history of man. The epidemics of smallpox which prevailed before the discovery of vaccination commonly took the lives of 10 to 30 per cent of the susceptible population. The effects of a single epidemic may be judged by the outbreak in 1752 in Boston which at that time had a population of 15,184. "Of this number 5998 had previously had smallpox. During the epidemic 5545 persons contracted the disease in the usual manner and 2124 took it by inoculation; 1843 persons escaped from the town to avoid infection."¹ Smallpox is now relatively rare in the United States of America where vaccination is on the whole very widely practiced, the technique of vaccination is generally good, and the quality of vaccine available is usually excellent. Even in the United States, however, one can study profitably the relation between universal vaccination and the incidence of smallpox. Hampton² has made the following tabulation, based upon the vaccination laws of the forty-eight states, and the incidence of smallpox in 1938-41 (some states with overlapping provisions fall into two groups):

GROUP	Annual case rate per 100,000 population
1. States (13, including District of Columbia) requiring vaccination of pupils as a prerequisite to school attendance, regardless of the presence or absence of smallpox	0.8
2. States (6) in which vaccination of pupils may be required at all times	3.0
3. States (10) having various permissive provisions regarding vaccination	3.6
4. States (12) having varying provisions which direct or authorize the exclusion of unvaccinated persons from school only when smallpox is present or threatened	6.3
5. States (9) which have no important laws or regulations promoting or efficacious in achieving the application of vaccination of the population	11.1
6. States (7) having various prohibitive provisions regarding the requirement of smallpox vaccination	13.2

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It is apparent from these figures that, where pre-school vaccination is required, smallpox becomes virtually non-existent. In Massachusetts, for example, there has been no case of smallpox for almost thirteen years. The ideal time to establish immunity to smallpox is in infancy, between the sixth and twelfth months. Earlier vaccination may not be effective, whereas delay beyond the twelfth month is in some respects undesirable. Vaccinations in infants are much more readily kept clean and free from secondary infection, and the rare but serious complication of post-vaccinal encephalitis is almost never observed in infants.

The effect of smallpox vaccination, like that of other vaccinations, largely wears off in the course of several years; but, as with other vaccinations, once immunity has been established, it can readily be restored by revaccination. Revaccination should be performed five to seven years after the initial vaccination, and it is well to repeat it at similar intervals thereafter. A safe rule to follow is to vaccinate in infancy, again on entering school or at least on entering high school, and thereafter whenever the patient may run any risk of being exposed to smallpox. In the presence of smallpox everyone should be vaccinated or revaccinated. Although it is quite true that persons vaccinated in infancy usually retain some immunity through life, such people occasionally contract smallpox which, though mild, is just as contagious as severe smallpox. It is essential therefore to vaccinate everyone in order to effectively suppress an outbreak of the disease.

The difficulties with vaccination which sometimes arise are chiefly due to failure to observe certain precautions, the most important of which are:

(1) Use fresh vaccine which has been properly stored and handled. Smallpox vaccine is the only vaccine in common use in this country which consists of a live virus; it is exceedingly easy to destroy by exposure to warmth or heat for a short time; yet, if frozen it can be kept for years without deterioration.

(2) Do not clean the arm with a strong antiseptic, or enough may remain on the skin to kill the virus. A good procedure is simply to clean the skin with liquid soap followed by acetone or ether.

(3) Use the multiple pressure method of vaccinating and keep the pressures within a $\frac{1}{8}$ -inch area. By this method the reaction can be kept small, and immunity is achieved with the production of an inconspicuous scar which may justly be described as a "sanitary dimple."

(4) Do not use a shield. Armstrong has shown and it has recently been reemphasized³ that the use of a shield introduces the risk of tetanus infection.

(5) Examine the vaccination at the third and seventh days—oftener if possible. This will insure adequate detection of the primary reaction which is developing rapidly by the end of seven days, the accelerated reaction which may reach its peak at any time between the third and the tenth day, or the immune reaction which on the third day will be subsiding but still clearly noticeable as a small reddish papule. Many reported "failures" have proved actually to be overlooked immune reactions.

(6) Postpone the vaccination of anyone having active lesions of atopic eczema. Such patients occasionally develop eczema vaccinatum and should therefore be excused from vaccination except during a smallpox epidemic.

Diphtheria. Next to smallpox vaccination, immunization against diphtheria has probably produced the most striking and tangible results of any immunization procedure. The incidence of diphtheria in Massachusetts during the last forty years may be taken as an example. The average diphtheria case rate by decades per 100,000 population in this state has been:

Decade	Ave. Case Rate	Comment
1904-13	234.7	No active immunization procedure available
1914-23	219.9	Toxin-antitoxin used on small scale
1924-33	87.7	Toxin-antitoxin widely used beginning 1923
1934-43	5.5	Toxoid widely used beginning 1935

Such results as these do not reflect improved sanitation, as some have argued. McKinnon and Ross⁴ have shown that, among groups of children living in the same community at the same time, partial immunization caused a 30 to 75 per cent reduction, and adequate immunization a 90 per cent reduction, of the expected diphtheria rate as observed among unimmunized children. Although striking results were achieved in the early control of diphtheria by the use of toxin-antitoxin mixture, the evidence gained during the last fifteen years has shown that diphtheria toxoid (Ramon's "anatoxin") is the better immunizing agent of the two. Moreover, toxin-antitoxin has the further disadvantage of containing animal serum, so that there remain few reasons for its continued use.

The principle features of current practice in diphtheria immunization may be summed up as follows:

1. Equally good results may be obtained with two doses of alum-precipitated toxoid or three doses of fluid toxoid, provided the doses are spaced at least three and preferably four weeks apart. The advantage offered by alum toxoid, of requiring one less dose, is offset by the possibility that alum toxoid may induce sensitization which will result in immediate reactions when subsequent doses of toxoid are administered.⁵ It should here be emphatically noted that the practice of "immunizing" with only one dose of alum-precipitated toxoid has been found to produce an undependable and relatively short-lived immunity. This procedure should never be given consideration in an immunization program.

2. Immunization should be carried out in infants preferably between about 9 and 12 months of age, without prior Schick testing. The case fatality rate from diphtheria is so much higher among infants than in older age groups that there is little justification for postponing immunization beyond infancy. Godfrey⁶ has shown that diphtheria is probably never really stamped out in a community unless a considerable percentage of the pre-school as well as of the school children have been immunized.

3. It is good practice to administer a booster dose of 0.5 cc. of toxoid to a child entering school. Any child not previously immunized should receive a complete course of inoculations as soon as possible after starting school.

4. Adolescents and adults need not be immunized unless they are exposed or are likely to be exposed, to diphtheria. Side-reactions to toxoid are relatively common and sometimes severe in this age group, due to a sensitivity to the proteins of the diphtheria bacillus acquired by many during childhood. It is therefore advisable to do a Schick test before immunization, to eliminate that proportion of the group, usually 50 per cent or more, who are already immune, and who also are at the same time most likely to react unfavorably to toxoid. Before receiving toxoid immunization, adolescents or adults should also be given an intradermal test with diluted toxoid or a small dose (e. g. 0.1 cc.) of toxoid subcutaneously. Those who show local reactions will be intolerant of larger doses subcutaneously, and should be immunized with graded doses of toxoid, if at all; at least 75 per cent of such reactors are already immune. Various practical procedures for such testing and immunization have been described such as that of Bunch, et al.⁷ Persons showing no reaction to the test dose can be carried forward with a regular course of toxoid; reactions will occur in a few but should be no more troublesome than those following typhoid immunization.

In the presence of an actual outbreak of diphtheria, the physician and health officer are usually too busy immunizing the susceptible population to have much time for anything else. A good procedure in an emergency, however, and one which has the advantage of including a booster dose for those who possess any latent diphtheria immunity, is to give 0.1 cc. of toxoid subcutaneously to everyone, and observe in twenty-four hours. Reactors can be dismissed from further consideration since perhaps three-quarters of them will be immune; non-reactors should be immunized immediately with the full course of inoculations.

Typhoid and Paratyphoid Fevers. In a sanitary world, immunization against these diseases should become unnecessary. Typhoid fever, however, still occurs sporadically even where water and milk supplies are in general properly controlled. Immunization is advisable, therefore, for persons who are intimately exposed to carriers, or who expect to live or travel in regions where the purity of milk or water supplies cannot be assured. The experience of the U. S. Army and elsewhere⁸ has shown beyond a shadow of a doubt that immunization against typhoid fever protects a very high percentage of persons against even the grossest exposure to the disease. Simmons states that in the U. S. Army during World War I typhoid and paratyphoid fevers "caused only 1529 primary admissions and 227 deaths among our four million soldiers. It has been estimated that if the Army typhoid rates of 1898 had obtained during the World War, we should have had 560,000 cases and 56,000 deaths due to typhoid."⁹

Primary typhoid immunization is accomplished by administration of three doses of 0.5, 1.0 and 1.0 cc. of the standard vaccine (1 billion typhoid bacilli per cc.) at intervals of not less than seven days. It is no longer considered necessary to hold strictly to a seven- to ten-day interval between doses, since longer intervals actually appear to induce a superior degree of immunity. Thus

the former practice of repeating a complete course of vaccination if the scheduled date for one dose was missed has been abandoned by the U. S. Army, which now recommends simply the resumption of any interrupted course of inoculations.

In recent years the procedure for re-immunization against typhoid fever has been considerably revised. Studies at the Army Medical School¹⁰ have shown that entirely adequate re-immunization may be accomplished by the annual injection of 0.5 cc. of vaccine subcutaneously or of 0.1 cc. intradermally. It would appear furthermore that the booster effect of such a single dose is accomplished regardless of the interval which has elapsed since the last previous dose of vaccine.

The desirability of including paratyphoid A and B components in a "typhoid" vaccine will depend on the incidence of these diseases in the community. Paratyphoid A is rare in most parts of the U. S. A., paratyphoid B is ordinarily a mild disease, and there are many varieties of paratyphoid fever against which no protection is afforded by either paratyphoid A or B vaccination. Since inclusion of the paratyphoid components increases the incidence and severity of reactions, the use of the "triple" typhoid vaccine should probably be restricted to those individuals or groups who are likely to experience an undue risk of infection with paratyphoid A or B organisms.

Tetanus. The experience of the French, British, and American armies^{11,12,13} before and during the present war has placed immunization with tetanus toxoid alongside immunization against typhoid fever as one of the great accomplishments in military preventive medicine of the present century. Tetanus in each of these armies has been almost non-existent since toxoid immunization as a general policy was adopted. In civilian as in military life, the prophylactic administration of tetanus toxoid not only decreases the risk of lockjaw, especially that caused by infection of trivial, unnoticed injuries, but relieves the immunized person of the necessity of injections of tetanus antitoxin, with the attendant incidence of serum sickness and the risk of sensitization to serum which may later be more seriously needed. If a full course of the toxoid has been followed by a stimulating dose one year later, and by another booster dose at the time of injury, the protection against tetanus appears superior to that furnished through use of prophylactic antitoxin. The relative merits of fluid and of alum-precipitated tetanus toxoid, and the recommended doses of either, are the same as given above for diphtheria toxoid, although by custom at least the acceptable interval between doses is frequently longer. Reactions in adults to tetanus toxoid are relatively mild in contrast to diphtheria toxoid.

Pertussis. The accomplishments in immunization against certain other diseases are somewhat harder to evaluate. Present knowledge concerning pertussis vaccine¹⁴ indicates that use of the more reliable vaccines now available may afford protection from the disease to over 75 per cent of those immunized. Since pertussis is now in most parts of the country the principal cause of death from the common childhood contagious diseases,

the use of a properly prepared pertussis vaccine in private practice has become generally accepted. The adoption of community immunization against the disease will depend largely on local conditions. In conjunction with any pertussis immunizations, however, it is necessary to keep in mind, and to inform parents, that this procedure is not comparable to smallpox or diphtheria immunization as far as the degree of prevention is concerned; but that among those cases which may be classed as vaccination failures, pertussis is ordinarily much milder than among unvaccinated children.

Scarlet Fever. Immunization against scarlet fever, with the toxin developed by the Dicks, although perhaps statistically more effective than pertussis immunization, is accompanied by reactions of such severity and frequency that "immunization against scarlet fever as a routine or community-wide practice under official auspices is inadvisable until a more suitable antigen becomes available."¹⁵ For nurses, physicians, and others likely to be abnormally exposed to the disease, however, immunization is desirable since the degree of protection (against the toxic effects of scarlet fever at least) is high.

Rabies. Prevention of rabies by vaccination represents, after smallpox vaccination, the classical historic example of this procedure applied to humans. Nowhere in the history of infectious disease control is there a more dramatic example of the application of vaccination than is presented in the control of rabies, with the often terrifying circumstances under which it is contracted, and the inexorably fatal termination which alone brings relief from the agony of those afflicted. Bluntly speaking, the occurrence of rabies is a stigma on any community. But as long as the disease is not obliterated, it will from time to time be necessary to vaccinate many more people than are actually exposed, since it is imperative to treat those for whom the absence of rabies in the animal cannot be proved as well as those who definitely have been bitten by a rabid animal. Considerable doubt has been cast from time to time upon the efficacy of rabies vaccine.¹⁶ Many of the unsatisfactory results of experimental vaccination, however, can be ascribed to invalid experiments or to the use of vaccines of inferior potency. The recent establishment of superior methods of preparing and of testing rabies vaccine should provide a sounder basis for immunization than has heretofore existed.

Other Vaccinations. It is interesting to note that the two human diseases of major importance for which vaccines were first developed—smallpox and rabies—are both of virus origin. With the exception of yellow fever little progress has been made in vaccination against other virus diseases. The search for a measles vaccine continues—with but meagre success so far.¹⁷ For the present one must be content with the production of attenuated measles by the properly timed use of the optimum dose of convalescent serum, placental extract, or the newly developed gamma globulin concentrate of pooled adult plasma.^{18,19} Against influenza, more progress has been made within the last few years. At least it now appears possible, by the use of a concentrated vaccine, to produce a relative degree of immunity, lasting a few months, against the two most prevalent strains of this disease.²⁰

Large scale clinical trials of this vaccine must await an extensive outbreak of the disease, while continued studies in this field give promise meanwhile of further improvements in the potency of the vaccine.

Hardly as much can be said for prophylactic vaccination against the common cold. The multitude of efforts to produce a vaccine against the cold virus have so far been defeated primarily by the inability to find a suitable animal in which to cultivate the virus. The so-called "cold vaccines," which consist of various mixtures of the commoner bacterial inhabitants of the upper respiratory tract, have been subjected in the last few years to several large-scale well controlled field studies.^{21,22,23,24} In these studies it has been found that no difference could be distinguished between the effects of an inert placebo and of various "cold vaccines," whether given subcutaneously, orally, or intranasally. In line with these findings, the Council on Pharmacy and Chemistry and the Council on Industrial Health of the American Medical Association in a joint report on cold vaccines, state that "the weight of careful studies clearly indicates that none of the vaccines now available when administered by the routes advised has proved of value."²⁵

Among the rickettsial diseases in this country, prophylaxis against Rocky Mountain spotted fever has greatly reduced a hazard which in certain areas was otherwise extremely high. The methods for preparing this vaccine, developed at the Public Health Service Laboratory at Hamilton, Montana, have contributed also to the large scale control of typhus fever by the development of a vaccine analogous to that employed against spotted fever.

A few general considerations regarding vaccination may be brought together at this point. The prophylactic procedures described above represent only those which are of major significance in this country, or which have been successfully applied on a global basis. Many other preparations are being studied or tried in the field, and some have already contributed significantly to the prevention of exotic or less common diseases. By present-day standards, it is possible to demand that large-scale, well controlled and statistically valid field studies be conducted on a new preparation before it is considered safe and effective for general use. Given assurance that a vaccine is clinically acceptable, it is then essential to be assured of its continued potency and safety during large-scale preparation and distribution. This is accomplished for the more widely distributed products in this country by the admirable control methods set up by the U. S. Public Health Service, and by the high standards of cooperation in this respect on the part of the producing laboratories. There then remain many questions concerning the best means for employing the various prophylactic preparations. Repeated reference has been made in this paper to the periodic use of a single booster dose for maintenance of immunity, and this procedure is becoming more widely adopted, as newly developed methods for testing the efficacy of vaccines provide means for showing that the booster dose has achieved its purpose. The advantage of a long interval between individual doses in a course of vaccination has been stressed, and it is to be expected that longer intervals will be more

generally adopted as further experience accumulates. Alum-precipitation, or aluminum hydroxide adsorption, appear to enhance considerably the immunizing action not only of toxoids but also of those bacterial vaccines in which they have been tried. In this connection, combined toxoids, and toxoids combined with bacterial vaccines, have been given wide use in the last few years and on the whole have showed up very well as antigens. Since such preparations appear to make effective immunizations practical with smaller total doses of antigen, it may prove possible, by cutting down the unit dose, to compensate for the tendency of precipitated or adsorbed combined antigens to cause undue reactions.

Little has been said about modified routes of vaccination. Intradermal vaccination has been applied to protection against typhoid fever, scarlet fever, diphtheria, and other diseases; it works remarkably well for re-immunization, but there is some question as to whether it is dependable for primary immunization. Little that is good can be said for oral vaccination, which when carefully studied has almost consistently proved inadequate as an immunizing procedure. The problem of protecting infants from diphtheria and whooping cough in early infancy has recently been approached by antenatal immunization of the pregnant mother.^{26,27} It is too early, however, to evaluate the actual efficiency of this procedure.

It can be seen that the field of prevention of disease through immunization is entering a period of unparalleled exploration, development, and reconstruction on a sounder scientific basis. The threshold of understanding of the physico-chemical nature of the immunity mechanism may indeed have been reached; and once this threshold is passed, the advances of the next seventy-five years should bring us much nearer to the day foreseen by Theobald Smith: "The final suppression" (of the plagues) "presupposes a world organization of human society without wars, and disarmed, such as the most pronounced idealist of today can scarcely conceive, but toward which human society must tend, to survive in the struggle with animal and plant life, microscopic and ultramicroscopic."

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GIFT FOR CANCER RESEARCH

Mrs. George Chase Christian, President of the Citizens Aid Society, recently announced distribution of the remaining capital assets of that society which for thirty years has supported various cultural, educational and welfare activities in Minneapolis. Cancer has been one of the special interests of this society since 1924 when the trustees provided funds for the construction of the Cancer Institute addition to the University Hospital. This institute is a memorial to Mr. George Chase Christian, the son of Mr. Henry Christian who established and endowed the Citizens Aid Society. Since the construction of the Cancer Institute, additional grants have been made to the Medical School from time to time for special equipment and for the support of educational work and research in the field of cancer. The trustees set up a trust fund to provide \$12,000 annually for a period of ten years for the support of the Cancer Institute. This fund will be utilized for research and educational work in cancer.

The Conquest of Tuberculosis

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WHEN the first issue of the JOURNAL-LANCET appeared in 1870, the only fact concerning tuberculosis that had been scientifically established was its contagiousness. The disease had already been given various designations, such as phthisis by the ancient Greeks, consumption by the English, tuberculosis by Schoenlein of Zurich in 1839, and the white plague by Oliver Wendell Holmes in 1861. Although inspection as used by the ancients, percussion as presented by Auenbrugger (1761), auscultation with the stethoscope as presented by Laennec (1815) and clinical thermometry as introduced by Wunderlich (1869) were in use, the JOURNAL-LANCET announced to its readers the discovery of the tubercle bacillus (1882); tuberculin (1890); the x-ray (1895); and the bronchoscope (1898). The fine armamentarium acquired during the latter half of the nineteenth century was so new that physicians did not know how to use it to best advantage before the century closed.

Isolation of Contagious Cases. Early in the twentieth century it became obvious that the disease could not be controlled unless those who had it (both man and animal) were prevented from disseminating tubercle bacilli to others.

New York City was the first political division in this country to require that all cases of tuberculosis in public institutions (1893) and all under the care of private physicians (1897) be reported to the Health Department. Now every state has a law or a board of health ruling making the reporting of cases mandatory.

To prevent the dissemination of tubercle bacilli it was obvious that persons with contagious tuberculosis must be isolated from the public. Institutions for this purpose were already in use but many more were necessary. Building of sanatoriums went forth until today we have more than 90,000 beds. Obviously any community must have a place for the isolation of every contagious case of tuberculosis if it hopes to control the disease. Our sanatoriums have removed from homes and communities many contagious cases but they have created a serious problem by spreading tubercle bacilli from patient to patient, to personnel, and to visitors. Only recently has any worthwhile attention been paid to the protection of others against the tubercle bacilli of institutionalized patients.

Compulsory isolation of patients is practiced in an extremely limited way. However, in each state there exists legal authority for quarantine and isolation of persons with contagious tuberculosis.

Incorrigible or recalcitrant individuals with contagious tuberculosis have often refused institutional care or have deserted institutions and continued to disseminate tubercle bacilli. The serious problem they create is being solved by providing places where they can be committed and

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actually imprisoned as are those who commit other crimes.

Tuberculosis Among Animals. Although it had long been suspected that the bovine type of tubercle bacillus was readily transmissible to man, it was not until 1902 that Ravenell recovered pure cultures from a child who had died from tuberculous meningitis. It was later found that in countries which have not controlled the disease in cattle, 25 per cent of the fatal meningitis and generalized miliary tuberculosis, 50 per cent of involvement of the skin and superficial lymph node, 25 per cent of the bones and joints, 20 per cent of the urogenital system, and 1 to 6 per cent of the cases of pulmonary tuberculosis are produced by the bovine type of bacillus. Many humans develop primary tuberculosis from the bovine type of bacillus and hence react to tuberculin.

The veterinarians had long tried to control tuberculosis in the cattle herds. They used the stethoscope, the clinical thermometer, the microscope and the x-ray, all to little avail, for these methods revealed the disease usually after it was extensive and had become contagious. As soon as tuberculin was available they found it almost 100 per cent efficacious. By experiments of gigantic proportion they proved that nearly all animals that react to the test have tuberculous lesions in their bodies, whereas, those which do not react are nearly always free from such lesions. Obviously, the solution of the problem consisted of finding the tuberculin reactors and removing them from the herds. Despite the fact that this information became available in 1892 the disease was allowed to cost the owners of cattle of this country \$300,000,000 every ten years.

In 1917 a nation-wide tuberculosis control program was instituted and any county which controlled tuberculosis so that only one-half of one per cent or less of the entire cattle population reacted to tuberculin was officially certified as a modified accredited area. By November 1940 every county had been certified and the entire nation was designated as a modified accredited area. This was accomplished at a cost of approximately \$260,000,000.

Since 1917 veterinarians have administered 271,130,010 tuberculin tests to the cattle of this country, and the carcasses of the 3,872,416 reactors have been examined at postmortem. This is truly man's greatest victory over tuberculosis. It was a victory over great economic loss, as well as over a considerable segment of tuberculosis in the human family.

Results of Isolation of Humans and Control of Disease in Animals. Following close upon the control of tuberculosis among cattle appeared a tumbling down of the infection attack rate, the morbidity and mortality from tuberculosis in man. When this century opened the mortality rate was 200 deaths per 100,000 population annually; now it is 42 per 100,000. In 1900 it was

thought that well nigh 100 per cent of all human adults had primary tuberculosis. Today there are large areas in which only 5 to 10 per cent of the girls and boys of eighteen years have this condition. Last year, in testing a large number of students in colleges and universities in various parts of the United States an average of only 18 per cent was found to have primary tuberculosis. In ten of the midwestern and northwestern states less than 10 per cent of the students reacted. In a group of grade schools in Minneapolis 47.3 per cent of the children had primary tuberculosis in 1926; 18.9 per cent in 1936; and 7.7 per cent in 1944. While this is a worthwhile accomplishment the incidence of infection is still far too high. This has been recognized for some time and therefore refinements in control measures are being developed.

Fundamental Factors. It was found that the disease develops in two distinct phases: (1) the primary or first infection phase (formerly designated tuberculous infection) which per se usually causes no significant illness either in children or adults; and (2) the secondary or reinfection phase which often causes illness and death.

The primary or first infection type of tuberculosis results in sensitivity of the tissues to tuberculo-protein, after which its presence can be detected with great accuracy by the tuberculin reaction as long as tubercle bacilli remain alive in the body. However, x-ray inspection of the chest never reveals good evidence of the presence of this type of tuberculosis in more than 20 to 30 per cent of those in whom it exists.

The development of primary tuberculous lesions is the first step in the evolution of tuberculosis in the human body. From this beginning the disease may cease to progress. Again, at any subsequent time acute or chronic reinfection type of lesions may result from endogenous or exogenous reinfections.

The ultimate toll among persons with primary tuberculosis (tuberculous infection) is much higher than is generally believed. Bogen presents evidence to show that approximately 50 per cent of tuberculin reactors at some time develop reinfection type lesions, some of which are brought under control without resulting in symptoms. Others lead to illness from which some individuals recover, and some die.

To many Bogen's figure seems high, but the fact remains that practically all lesions which cause illness and death are preceded by the primary type of tuberculosis. In countries where infection is universal among adults, from one-fourth to one-third of all deaths have been reported due to tuberculosis. Therefore an infection with tubercle bacilli, as manifested by the tuberculin test must be considered significant and managed accordingly.

Obviously, an initial attack of tuberculosis does not result in dependable immunity; indeed, it is only persons who have passed through such an attack who subsequently develop destructive forms of the disease. It would seem, therefore, that attempts to produce immunity artificially constitute the wrong approach to the solution of the tuberculosis problem.

DIAGNOSTIC AGENTS

Since the toll of tuberculous infection is so great and it does not satisfactorily immunize, it behooves physicians to detect its presence as soon as possible after it occurs and to be on guard for subsequent developments. This immediately places the *tuberculin test* in the forefront as it is the only accurate and satisfactory means of detecting the presence of primary tuberculosis. Any person who does not react to tuberculin properly administered can, with well-known exceptions, be told that his body does not contain living tubercle bacilli. On the other hand, the individual who reacts characteristically can be informed that tuberculosis is present in some stage of its development and the lesions contain living tubercle bacilli. The only exception is in the event all bacilli die and allergy lingers for a time before it disappears. The tuberculin reaction affords no information as to whether a given reactor has or will have clinical tuberculosis. It only indicates that the two prerequisites for the development of clinical disease are present, namely, allergy to tuberculoprotein and live tubercle bacilli.

History of exposure may be significant if known, but usually less than half of infected individuals know where the infection was contracted. The tuberculin reaction determines accurately whether there has been exposure.

In the body of the tuberculin reactor clinical lesions may appear in any one of numerous locations. Many of these parts do not lend themselves well to examination and the disease is not suspected until symptoms appear. In diagnosis campaigns these have been sadly neglected, and nearly all of the emphasis has been placed on the lungs because: (1) they constitute a common site for clinical tuberculosis; (2) pulmonary lesions are likely to disseminate tubercle bacilli to others; and (3) the lungs lend themselves better to x-ray inspection than any other part of the body. *Symptoms* may be important when present, although they are never pathognomonic. Moreover, they rarely appear until the disease has reached an advanced stage, and even then they may be absent.

The x-ray is superior to other phases of the physical examination from the standpoint of locating lesions before they cause illness but the following limitations seriously handicap it as a tuberculosis diagnostic agent: (1) On the usual single film of the chest one visualizes only 75 per cent of the lungs; (2) 70 to 80 per cent of primary lesions in the chest are not visualized; (3) only gross lesions cast shadows visible to the unaided eye. Most tuberculous lesions are microscopic in the beginning and many remain so; (4) macroscopic deposits of calcium and bone may cast shadows but from them alone one cannot determine the numerous etiological factors; (5) shadows cast by acute and chronic forms of the reinfection type of pulmonary tuberculosis do not differ from those of a number of other diseases of entirely different etiology. Therefore, to diagnose accurately from x-ray shadows alone is a hopeless task. These and other limitations of the x-ray are not generally appreciated, even by the medical profession, and thus overenthusiasm has been allowed to create the false impression in the public mind that all tuberculosis can be detected by x-ray.

inspection. The x-ray is not a substitute for the tuberculin test in any sense of the word. The test affords information which is impossible to obtain from the x-ray and vice versa. To omit the test and proceed to the x-ray is not good diagnostic procedure. It is equally bad to fail to make x-ray inspection of the chest of every adult tuberculin reactor.

The fluoroscopic screen enables one to visualize shadows of large areas of disease in the lungs. Indeed, more of the lung can be seen with this screen than with the single x-ray film, since the chest may be rotated in the former procedure. However, it is extremely monotonous for the physician to use the fluoroscope over considerable periods of time and a permanent record is not made of the images.

The absence of shadows caused by tuberculosis on one date does not guarantee that they will be absent among adult tuberculin reactors at any subsequent time. Therefore, x-ray film inspections of the chests of such persons must be made periodically. Only a few years ago this seemed impossible for two reasons: 1. The exorbitant cost which usually was \$25.00 to \$30.00. Even if it were only \$3.00, one still could not hope to procure funds for an adequate amount of x-ray work. 2. Cumbersomeness of x-ray equipment; until recently a fully equipped machine with its personnel working to capacity was capable of exposing the chests of about 200 persons per day.

When the value of x-ray inspection of the chests of adult tuberculin reactors and the large number of inspections necessary was recognized a rapid x-ray camera was invented (1932) which is capable of making 1,000 exposures per day on paper film prepared in rolls for 100 exposures. The 100 films are processed in approximately one-hundredth of the time required by the old method.

This rapid method of making x-ray films has progressed, and today these superior films are quickly exposed, developed and delivered to the physician for description of shadows, and at low cost, (\$1.00 or less). The presentation of this rapid method of making x-ray film inspection of the chest is second in importance only to the discovery of the x-ray itself.

In 1934 another method was introduced which consists of using a camera with 35 x 35 millimeter film to make exposures of chest shadows from the fluoroscopic screen. This minute film must be magnified for inspection of shadows. Later films of 4 x 5 inches and 70 x 70 millimeters were introduced. These can be viewed stereoscopically with little or no magnification. All of these small films are known as photofluorograms and can be exposed at the rate of 1000 or more a day per machine. The film itself costs only a few cents, but processing and reading is little or no less expensive than when standard size films are used. Therefore, the total cost is not as small as it seems on first thought. When questionable or definite shadows are present, it is advisable to re-ray on standard size films. Photofluorograms require relatively small storage space.

As to making x-ray inspections of the chest, the phototimer, recently presented by Morgan, will eliminate many of the present shortcomings. Where funds and circum-

stances do not permit the use of films of standard size, certainly photofluorograms and even fluoroscopic inspection should be used. In any event, the x-ray is only one phase of an adequate examination. To be most effective in the diagnosis of tuberculosis it must be used in conjunction with the tuberculin test, as well as clinical and laboratory procedures.

The bronchoscope, introduced by Killian in 1898, was destined to play a unique role in the diagnosis of tuberculosis. Indeed in some cases it is only through the use of the bronchoscope that the diagnosis is possible. The Arneth-Schilling blood counts and the red blood cell sedimentation rate may be helpful but they are not specific.

The microscope is the final court of appeal in arriving at the actual diagnosis. However, obtaining material for microscopic inspection sometimes requires special procedures. In some cases gastric lavage is helpful. Numerous acid-fast saprophytes in nature appear identical with tubercle bacilli. Therefore organisms found in any material should be tested for pathogenicity by animal inoculation.

The great need at present is a method of determining when persons with primary tuberculosis begin to develop the reinfection type of disease; that is, when the involvement is in the preclinical stage and before it has attained such gross proportions as to cast x-ray shadows. Caulfeild, Ogden, et al., believe such a diagnostic agent is now available in the Caulfeild inhibitive reaction and the tuberculo-complement-fixation test.

TREATMENT

Physicians of ancient times employed sunbaths, hyperpyrexia, bleeding, milk and egg diet, blistering of skin, change of climate and altitude, as well as sea voyages. Fresh air faddism had its day but when it was learned that fresh air, usually meaning outside air, has no specificity in tuberculosis and is often injurious to patients by being too warm, too cold or by containing harmful contamination, common sense demanded the use of conditioned air; that is, air that is cooled to the proper temperature on certain days, warmed on others, adequately humidified or dried, and relieved of its contamination. Observation has taught that for sick persons strict bed rest is as important as in other illnesses, such as typhoid fever. Exercise is limited to those who have overcome symptoms and whose lesions have become stationary or nearly so and even then it is prescribed with great caution.

The use of localized rest in treating the diseased part was learned from nature, after which involved bones and joints were immobilized by surgery, and lungs by artificial pneumothorax, extrapleural thoracoplasty, etc. Unfortunately the disease is not cured by these procedures in the strict sense of the word, inasmuch as the tubercle bacilli are not destroyed. Despite this fact, collapse therapy has converted many persons from the contagious to the non-contagious stage and has restored large numbers to partial or complete working capacity. Moreover, artificial pneumothorax has prevented many from falling ill or becoming contagious. Recently lobectomy

and even *pneumonectomy* have been of value in some cases.

It appears that nearly every plant has been employed as medicine, as expressed by Kipling:

*"Anything green that grew out of the mold
Was an excellent herb to our fathers of old."*

Nearly all drugs in the pharmacopeia, both singly and in combination, have been used in the treatment of this disease, but until recently none was found to have any specificity. The sulfones have been most spectacular in their effect upon tuberculosis in guinea pigs. The three that have been most extensively used are promin, diasone and promizole. While their effect on tuberculosis in guinea pigs is almost miraculous, they have not been found so efficacious for tuberculosis in humans. This may be due to selection of cases; that is, in those treated the disease has so entrenched itself that it is impossible for the drug to reach the bacilli in adequate concentration. It would seem that these drugs should not be abandoned until they have been employed in recently acquired primary tuberculosis to determine whether the disease actually can be destroyed at its very beginning. Chemists are at work on the preparation of numerous other sulfone derivatives, and it is possible one will be produced by which tuberculosis may be treated as successfully as some of the other infections are now treated with sulfonamides.

Although penicillin has failed to show therapeutic effects against infections due to the tubercle bacillus, recently another antibiotic substance, streptomycin, has been found to exert impressive effects in vitro and in vivo against this organism. The potentialities of this recent development appear far-reaching but have not as yet been sufficiently explored.

ADDITIONAL CONTROL METHODS

Obviously the control of tuberculosis consists in finding the individuals who have it in any stage of development and preventing them from spreading bacilli to others. Certain groups lend themselves better to case finding than others because of such factors as (1) availability of examination, and (2) prevalence of disease.

Hospitals. Dr. Ralph Kinsella states that from 1924-29 the medical staff of St. Mary's Hospital in St. Louis, Missouri, arranged for x-ray inspection of the chest of every admission. This netted a large number of unsuspected cases of chest diseases. In 1936 Dean H. S. Diehl provided for routine tuberculin testing of the entire personnel and all admissions with x-ray film inspection of the chests of reactors at the University of Minnesota Hospital. The same procedure was adopted by Dr. F. E. Harrington at the Minneapolis General Hospital in 1938. In both of these institutions the value of searching for tuberculosis among members of personnel and patients was so clearly demonstrated that the procedure has become permanent in them and is now practiced in many other hospitals, particularly those for the mentally ill. There are approximately 15 million persons admitted to hospitals annually in this country and another 15 million are examined in out-patient departments of these institutions. It is a simple matter to add to these 30

million examinations the necessary procedures to determine the presence or absence of tuberculosis. A national movement is under way for this accomplishment.

Offices of Physicians. Every physician's office can easily become a tuberculosis clinic by administering the tuberculin test to all individuals examined and completing the necessary procedures for the reactors. Thus another group of several million persons could be examined each year. Already large numbers of physicians' offices are engaged in this work.

Contacts. Obviously the known contacts of persons with contagious tuberculosis provide a fruitful field in case finding. While work among them is extremely valuable it is not adequate to control tuberculosis in any community because of unsuspected contagious cases. There are places where as many as 40 to 50 per cent of the cases are first reported to the health departments by death certificate. Moreover, there are cases whose disease is discovered at postmortem, and since the percentage of dead bodies so examined is not high, many cases are never detected.

School Systems. There is now a tendency to neglect the examination for tuberculosis in preschool and school children. This should be most severely condemned. Although below the age of fourteen years, the child with chronic, reinfection type of contagious tuberculosis is almost a rarity, many a child reacts to tuberculin, indicating the presence of primary tuberculous lesions. It is profitable to seek the source of exposure among the child's adult associates. *The infected school child of today often is the contagious tuberculous adult of tomorrow.* Clinical tuberculosis is found occasionally among high school students, and slightly more frequently among college and university students. Tuberculosis work among personnel and students of all educational institutions, from kindergarten through graduate schools of universities, should be intensified.

The Aged. Among persons beyond the age of fifty years there exists relatively more contagious tuberculosis than in any preceding age period. Girls and boys have been so protected against tubercle bacilli and consequently so little clinical disease is developing among the younger adults, that already clinical tuberculosis has been spoken of as a disease of elderly people. Examination of the aged is important.

Mass X-ray Surveys. It is laudable and practical to use x-ray inspection as a coarse screen of the chest of every adult in a community, or industry, etc., on one occasion, for in addition to shadows cast by gross tuberculosis those of other conditions such as malignancy and cardiac abnormalities may be seen.

Since selective service was instituted approximately 15 million men and women have had x-ray inspection of the chest. In about 1 per cent shadows were found but on complete examination many of the lesions were of no clinical significance and others were nontuberculous. Long ago well controlled lesions were observed at postmortem. Now when we see x-ray shadows of them we are in danger of losing poise to the extent of reporting them as cases of clinical tuberculosis and thus swell the number

of new cases found. In the group with clear x-ray films there are those with tuberculous lesions destined to reach macroscopic proportions in the near future. However, in most places it is a physical impossibility to reread the total population with sufficient frequency to discover these lesions before they become advanced. This point is well illustrated in the examinations for military service in the present war where the x-ray was employed as the sole means of determining the presence or absence of tuberculosis. Although these x-ray inspections screened out most of the gross lesions, they completely missed the much larger number which had not yet evolved to macroscopic proportions. Some of them were evolving so as to later become clinical and detectable. Already thousands of persons have been discharged from military service because of tuberculosis. While it is true that in some of these cases shadows were overlooked at the time of induction it is also true in many no visible shadows were present. No doubt some of the approximately 75 per cent who entered military service uninfected have now received their first infections. However, not enough time has elapsed for the disease to mature to clinical proportions in many of them.

All-Out Program. In large areas of the United States tuberculosis work has been so effectively done that an all-out campaign is now practical. For this program the county is a good unit and is already being used effectively in one state. All citizens, regardless of age, are tested with tuberculin and the adult reactors whose x-ray films reveal shadows are completely examined to determine etiology. All children and adult reactors are examined for the presence of extrapulmonary lesions, such as those of the bones and joints, from which sinuses may liberate tubercle bacilli. Those found to have clinical tuberculosis in any form are treated or isolated as indicated. All non-reactors from birth to senility are retested annually and those found to have become reactors are observed as those who reacted on the first examination.

Finding the Early Case. In controlling tuberculosis the most important step is to prevent the original infection with tubercle bacilli. At the outset, however, we must cope with approximately 40 per cent of the nation's total population which is already infected. Mass surveys, etc., immediately screen out most of those who at the moment have gross lesions in the minimal, moderately and far advanced stages. As of November 1944, there were 1,068,244 examinations made by the United States Public Health Service. On the basis of an analysis of over half of these cases, approximately 1.5 per cent showed x-ray evidence of reinfection tuberculosis of which approximately 65 per cent were minimal, 30 per cent moderately advanced, and 5 per cent far advanced. Among the remainder are those destined to develop gross lesions, and the most important step is to find these

lesions while they are early and before they have caused illness or have become contagious.

We must differentiate between the minimal and the early lesion. The former may have been present indefinitely without having been of clinical significance, whereas, the early lesion has recently developed so as to be detectable. For almost a quarter of a century in the Minneapolis Division of Health Tuberculosis Service (formerly Lymanhurst) we have studied the various methods of detecting early lesions. At first stereoscopic x-ray films were made of the chests of all persons examined regardless of reaction to tuberculin, symptoms, etc. These inspections were made annually for sizeable groups of individuals. In some whose chests were originally clear on x-ray inspection there later appeared one or more areas with changes so slight that one could not determine whether lesions were actually present. Frequent periodic inspections in some of these cases, however, left no question as to the presence of lesions which slowly produced larger and larger shadows and ultimately by other methods the majority of them were found to be tuberculous.

On analysis we discovered that all persons who developed chronic tuberculous lesions under our eyes came from the group of tuberculin reactors. Moreover, these lesions usually did not become visible except in adulthood. Therefore, we discontinued making films of the chests of non-reactors to tuberculin in all age periods because it seemed futile to be looking for something that could not possibly exist by reason of absence of tubercle bacilli. Of all the methods used, we came to the conclusion that the only one which is scientific, accurate and wholly satisfactory for discovering the early chronic tuberculous lesion is that which makes annual x-ray inspections of the chests of adult tuberculin reactors, with complete examination of those with lesions which cast shadows.

The ultimate goal is to create an environment everywhere so free from tubercle bacilli that all girls and boys can attain adulthood and live throughout the span of life without the hazards of tubercle bacilli in their bodies. Already this goal has been nearly achieved in a few parts of the United States, and earnest attempts are being made to reach it elsewhere. In 1944 a federal law was enacted which authorized the expenditure of 10 million dollars annually for tuberculosis control work by the Tuberculosis Division of the United States Public Health Service. Funds are to be allocated to the various states through the state health officers. On first thought this seems like a large amount, but annually we spend approximately ten times as much just to maintain our sanatoriums. However, this is an excellent beginning, and under the direction of Dr. H. E. Hilleboe we have reason to believe that the fundamentals in tuberculosis control will be employed with an ultimate accomplishment no less spectacular than that of the veterinarians.

Preventive Geriatric Medicine

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GERIATRICS, as that part of medical practice concerned with the aging and the aged in both normal senescence and illness in later years, can be said to owe its existence to preventive medicine. The two fields of thought and effort are inseparable. There is no need to emphasize here that the tremendous reduction of deaths in infancy and youth which has marked the last seventy-five years as epochal is attributable chiefly to preventive activities. Improved sanitation, quarantine and isolation of contagious patients, prophylactic immunization and prompt institution of specific therapies have dramatically lowered infantile and juvenile death rates. As a result many millions of children who formerly would have died in youth have survived into later maturity. Though the aging and the aged have always been with us and have always presented clinical problems peculiar to senescence and senility, it is only recently that the study of these problems held more than academic interest. The present rapid expansion of interest in geriatrics has a decidedly pragmatic foundation.

Seventy-five years ago there was little need for special attention to geriatric problems. The aged were relatively few. In 1850 the average life expectancy at birth in New England (the only comprehensive American data available for that time) was but forty years. By 1900 this had risen to 47 years for the United States as a whole and since then the increase has been dramatic. In 1940 life expectancy at birth was over 63 for white members of the population. In 1942 the average length of life was 64.82 years.

Looking at the changing picture of humanity from another angle one sees that in 1900 only 17 per cent of the total population of the United States were forty-five years old or older. In 1940 26.5 per cent exceeded forty-five years. Conservative projection results in the estimate that in 1980 more than 40 per cent of the population will have reached an age of forty-five. The median age increased from 26.4 years in 1930 to 28.9 years in 1940. An increase of two and one-half years in median age in a single decade can be ignored only by those mentally blind. Continuation of present trends will bring the median age of our nation to forty-four years in another half century. Furthermore the number of persons over sixty-five years of age increased 35 per cent in the ten years from 1930 to 1940, in contrast to an increase of only 7.2 per cent in the total population. There are now well over 13 million people in the United States sixty years old or older.

Life expectancy in later years has increased but little in contrast to the improved prognosis for infants and children. Nevertheless it is impressive that today the average woman of forty has an expectancy of 33.8 years more of life; the average man of forty will survive 30.3 years more. Age sixty-five will be attained by about

three-quarters of those persons now forty-five and by four-fifths of those now fifty-five.

Such figures speak for themselves. The nation is growing older. We are truly entering upon an age of age. The situation is without precedent and at first flush seems to be cause for triumphant congratulations over the accomplishments of medical science and practice. But mere survival is not enough. The picture is not as happy as it should be. Were the greater share of the increasing millions of elderly persons well, vigorous and strong, we could truly rejoice and anticipate an era of wisdom and plenty. But they are not. Instead, beset by chronic and progressive disorders which lead to accumulative impairment and disability, too many older people become at least partial invalids, often protracted burdens to themselves, family and community. The need for increasing knowledge of the biology of senescence and concerning the degenerative disorders so common in later years is truly urgent. Life has more than length. It has, or should have, depth and breadth. Longevity without health can be a dreadful curse. Longevity with health and continued usefulness is a priceless privilege.

Past and present preventive medicine has focused its attention upon infective diseases, battling to remove hazards from the environment. Such strategy has been marvelously successful in preventing disease due to exogenous influences. But mere extension of these tactics can not solve the present and future problems presented by the degenerative diseases of later years. New methods are needed. The illnesses of youth and of senescence are very different and require equally divergent prophylactic strategy.

The diseases characteristic of the first half of life and those typical and most common in the second forty years are perhaps most simply contrasted by tabulation:

Diseases characteristic of:

YOUTH	SENECENCE
Etiology: Exogenous Obvious Specific (single) Recent	Etiology: Endogenous Occult Cumulative Multiple (super-imposed) Distant in time
Onset: Florid	Onset: Insidious; asymptomatic
Course: Acute Self-limited Immunizing	Course: Chronic Progressive (long disability prior to death) Not protective (increased vulnerability to other diseases)
Little individual variation	Great individual variation

These differing attributes are immensely significant to preventive medicine. It is essential that we recognize that the causation of the chronic progressive diseases, such as arteriosclerosis, hypertensive disease, hypertrophic arthritis, diabetes mellitus, gout, cancer and chronic nephritis is essentially endogenous and cumulative. These characteristics imply first that the etiology is obscure and multiple, and secondly, that the causes are not amenable to control by measures directed against the external environ-

ment. As *all prevention must be based on cause*, the etiologic characteristic of the so-called degenerative disorders are particularly important. It is necessary to keep in mind that each individual instance of a given disorder, such as hypertensive disease or diabetes mellitus, results from a series of superimposed factors and that these factors are very rarely identical in any two cases. Thus diagnostic analysis of etiology requires a high degree of individualization and much more diligence and diagnostic acumen than is necessary, for example, to discover the cause of an acute rash in childhood. Identification alone suffices in the latter instance. But discovery of arterial hypertension does not inform as to its cause in a given patient. Modern medicine demands we determine "why" as well as "what" in diagnostication.

Prevention of the chronic disorders of later years will be possible only if the initiative is taken by the patient. In this respect preventive medicine for adults differs greatly from that for children and younger people. Individual variation and the insidious asymptomatic onset of these disorders tend to delay medical consultation, and thus make etiologic analysis even more difficult.

Characteristics inherent in the senescent individual also obstruct prevention of degenerative disease. Older persons are changed, both functionally and structurally from what they were in youth. They are not the same people, just a little bit older. These changes, which we can not enumerate here, alter the reactions to disease, change the symptomatology and affect both prognosis and therapy. Study of these changes and their significance is an obligation of every physician, for without an appreciation of the changes introduced by aging, gross errors in diagnosis and management are inevitable. Geriatrics is not, and should not be, considered a sharply demarcated specialty, but rather a point of view which takes cognizance of the changes inherent in senescence. The greatest advance in both preventive and therapeutic pediatrics was made when it was at last recognized that the child is not merely the little man, but presents structural, nutritional and immunologic *attributes peculiar to his age*. Precisely the same concept forms the foundation stone of geriatrics.

The future of preventive medicine as applied to adults has for its basis the periodic health inventory. As we previously stated, the initiative must be taken by the patient in order to obtain individual guidance toward maintenance of health. The choice of the term health inventory is deliberate, for the procedure should be much more than a mere physical examination. Periodic examinations have fallen into ill repute in many quarters, largely because too many were carelessly and superficially conducted and because too little use was made of the information elicited. The average physician has been prone to say, "I can find no disease; therefore you are well." In contradistinction, the objective of a health inventory is measurement of health. Health is always relative and therefore there is always room for improvement. Alteration of the medical viewpoint so that diagnostic study means a search for evidences of deprivations in health, rather than for the appearance of frank disease, would

most certainly lead to a great advance in medical practice. We should be vastly more concerned with the patient than with his diseases.

Early discovery of impairments in health, so that they may be arrested by proper guidance, is dependent upon the measurement of functional reserve capacities. If we wait for the appearance of frank clinical signs and symptoms of functional failure we will have waited much too long to accomplish anything prophylactically. Early deprivations in reserves are asymptomatic and can be revealed only by noting the physiologic responses to conditions of stress. Examination of the heart during rest, no matter how thorough, can not reveal the ability of this vital organ to respond to increased effort, any more than can auscultation, inspection or even roentgenography of an automobile engine reveal its ability to climb hills. Therefore the essence of health mensuration is testing functional reserves by deliberately inducing conditions of stress. This basic principle is particularly pertinent to disorders involving the cardiovascular-renal system, metabolism and nutrition.

The second function of the periodic health inventory is that of guidance. Obviously the whole benefit derived from periodic consultation depends upon the wisdom, appropriateness and feasibility of the advice presented. It is equally obvious that the ability to offer valuable guidance is dependent upon the accuracy of diagnostic analysis and the wisdom of prognostic judgment. The potentialities of personal and individual periodic guidance toward more nearly optimum health of mature adults are but little appreciated today. In order to develop these potential benefits to their maximum, the performance of the periodic inventory must be greatly improved.

There is a tremendous human inertia against preventive activities. This is in part attributable to the fact that the benefits of prevention are indirect and can be revealed only statistically. Statistics have almost no emotional appeal. We can not tell people that unless they carry out preventive activities they are sure to get into difficulty, for such is not true. We can say only that a certain number of so many thousand individuals will be benefited, but we can not predict just which ones these will be. Therefore continuing to offer adults preventive medicine as it is now understood will probably accomplish very little, for the great majority of people will continue to prefer to take chances and to assume that luck will be on their side. However, if we merely change the phraseology and broaden our meaning of prevention, there is hope that as much can be accomplished for those in later maturity during the next seventy-five years as has been accomplished for the young in the preceding seven and one-half decades. Let us take as our major objective *the construction of greater health rather than the avoidance of disease*. We then will offer the individual patient something which is personal and individually demonstrable. Preventive medicine has a negative connotation; constructive medicine is positive. The concept of health construction as a phase of medical practice is not new, though the phrase is. Pediatricians have demon-

strated that it is possible to make well babies healthier. There are no reasons whatever why it should not be similarly possible to make relatively healthy adults healthier. Personalized guidance toward a more nearly optimal nutrition, better balance between work and rest, more individually appropriate exercise, wiser mental hygiene and early discovery and prompt correction of minor disturbances, such as foci of infection, moderate degrees of anemia, obesity and the like can certainly do much to improve health in the later years of life.

It must not be imagined that we expect periodic health consultations to prevent all illness. This is impossible. But if properly applied such personal preventive medicine can serve the following significant purposes: (1) Improve the health of an individual so that if he does become the victim of some acute illness or accident his chances and speed of recovery are greatly enhanced; (2) Increase the individual's work efficiency, usefulness and sense of well-being; (3) Retard the progression of chronic disorders common in senescence and (4) Add to the length, as well as depth and breadth of life. It is a fundamental principle of geriatrics that in older people the prognosis of an acute illness is predicated just as much upon the condition of the patient prior to the disorder as upon what specific treatment may be applied during its course.

Such a future course for preventive medicine in later years as we have suggested is not without its limitations and obstacles. Though these are serious, they should not prove insurmountable. The greatest difficulty is the human inertia previously mentioned, coupled with the fact that the initiative must be taken by the people themselves. It will take a long and arduous campaign of education to counteract this inertia and to reestablish in the minds of men and women the idea that their health is their own, personal responsibility. The effectiveness of public health measures and sanitation has been possible because these measures involve neither initiative nor effort on the part of the beneficiaries. Furthermore, their cost per capita has been negligible; from 13 to 35 cents per capita per annum in urban areas. But these measures can not suffice. We can not give health; it must be earned. Somewhere and somehow people must learn that *longevity is a privilege and as a privilege involves the responsibility of personal effort to maintain health.*

The second obstacle in the way of individual preventive medicine is that of cost. Just as custom built goods cost more than those produced by mass production methods, personal health services are more expensive than public health. Yet for proper service there must be a high degree of individualization, time consuming thoroughness, and unusual skill on the part of the physician to detect the subtle and insidious changes which are the essence of health measurement. However, if it can be demonstrated that the benefits are as splendid as we have reason to believe they will be, relatively high cost should not prove too serious a handicap. Individualization is an absolute necessity; with increasing age there occurs an increasing divergence between individuals. We are what

we are today largely because of what we went through yesterday, and each one of us has had a different series of yesterdays.

The third difficulty to be overcome is lack of knowledge. We need to know very much more regarding the differences between normal or average and optimum. For example, for a long time it was assumed that just because the majority of people tended to gain weight in later maturity this was a normal phenomenon. Recent studies conclusively demonstrate that though such gain in weight is common, it is distinctly undesirable and affects morbidity and mortality adversely. There is also need of improvement in diagnostic methods, particularly development of stress functional tests to reveal deprivations of the different reserves. Our present ignorance regarding the etiology of most of the so-called degenerative disorders is the greatest obstacle to rapid progress in geriatric medicine. The answer to these limitations is research. This will take time, sweat and money, but the promise is worthy of any effort.

Preventive medicine for mature adults, as a part of geriatrics, is in its early infancy. Until recently there was little need for preventive activity. Today the proportionate increase in the numbers of elderly persons in our population makes the menace of chronic and progressive disease characteristic of the senescent period of life, a problem as equally urgent as the hazards of infections. In the future preventive medicine must add individual personal health construction to the present practices of environment control, or else fail. Neither strategy alone can suffice. Though the full potentialities of personal health guidance can not be realized until research has illuminated the etiology of degenerative disorders, much unnecessary illness in later years could be prevented by more thorough and more wide-spread application of present knowledge. Reawakening of a sense of individual responsibility is essential to progress. In this we have recently gone backwards as a result of politically motivated paternalism. Mature adults must realize that longevity and health are privileges and not rights. As privileges they carry the inescapable obligation of effort to maintain health.

As the degenerative disorders begin long before symptoms or signs become apparent, preventive geriatrics must begin long before senility. Prevention must precede. More can be accomplished for the aging than for the aged. Therefore the two decades from forty to sixty constitute the critical period in geriatric medicine. There are many reasons to hope that the next seventy-five years will permit of progress in this field comparable to the advances in the control of infectious diseases subsequent to the birth of bacteriology. It is essential that physicians, of all people, be acutely aware of the social and economic hazard of longevity without health. Longevity with vigor and usefulness retained until true senility creates infirmity is an objective worthy of our best and most energetic efforts. There should be a beautiful hope for the future now that men are at last living long enough to think.

Maternal and Child Health*

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IT is a strange paradox that wars and concern for the welfare of children go hand in hand. Most of the progress that has been made in the child hygiene field has been a result of war. Countries that have had repeated invasions or that have had large frontiers to protect have been the countries that have been leaders in promoting child health. France, a country that has always been faced with the necessity of protecting herself against invasion, was one of the leaders in the development of a modern child hygiene program. England made no preparation for a child health program until after the Boer War. The high percentage of physical defects found in the enlisted men at the time of the Boer War shocked the health authorities, and as a result that country started a system of school medical inspections. In our own country the large number of drafted men found to have physical defects in the first World War gave a great impetus to the interest in child care. Prior to the first World War only five state health departments had any organized child health programs. Within five years after the first World War, forty-three states had a statewide maternal and child health plan. There already is evidence that the large number of rejections for military service in the present war again has aroused the people of this nation to the need for still better provision for health care during childhood. While the United States has not undertaken the protection of child health because of the fear of armed invasion or the need of maintaining a large standing army, nevertheless its attention was called to the need for child protection and care by the same basic stimulus that gave Europe its impetus in the last century.

Prior to the turn of the century little attention was given in this country to the protection of the health of mothers and children. The major emphasis in the preventive medicine and public health program was on the control of communicable diseases and the improvement of the sanitation of the environment. Little concern was given to the welfare of the individual. Concrete evidence of the increased awareness of public responsibility for the health of mothers and children may be seen in the legislation which has been passed in this country since the last war. In 1922 Congress passed the first Federal Maternity and Infancy Act or the Sheppard-Towner Act. An appropriation of \$1,240,000 annually was made for the protection of the health of mothers and children for a seven-year period. The money appropriated under this Act was allotted to the states on a matching basis and was used specifically for educational work. Classes for mothers in prenatal and infant hygiene were established, well baby centers and prenatal clinics were started, and hundreds of thousands of booklets on prenatal, infant and child care were distributed. The public health

educational program carried on as a result of this legislation firmly established maternal and child hygiene work in the official public health agencies.

Between 1929 and 1935 there was no federal appropriation for maternal and child health work. During this period, however, most of the states did the best they could to carry on their programs with state and local appropriations. Interest in child welfare continued. In 1930 President Hoover called the White House Conference on Child Health and Protection "to study the present status of the health and well being of the children of the United States, and its possessions; to report what is being done; to recommend what ought to be done and how to do it." Approximately 1200 experts in all the fields of health and welfare devoted months of study and research to assemble material on the status of children at that time. The results of the findings of the Conference were published in several volumes and have served as a guide for the development of the health and social provisions for child protection since that time.

The Social Security Act passed in 1935 again provided federal appropriations for maternal and child care. Under Title V of this Act there was an initial appropriation of over \$3,000,000 for maternal and child health work and over \$2,000,000 for the care of crippled children. The greater part of these funds were allotted to the states on a matching basis. However, some of the money appropriated under the Social Security Act provided funds to be given to the states without matching and to be used to provide medical and nursing care for mothers and children in financial need. In the year 1940 over ten and one-half million dollars was spent by public health agencies on maternal and child health work, 60 per cent of this money coming from federal funds and 40 per cent from state and local funds. In addition, over three million dollars of federal money was spent for the care of crippled children.

The war emergency has brought another marked change in the provision of the federal government for maternal and child care. In March, 1943, the President signed the Act passed by Congress appropriating funds to provide obstetric, pediatric and hospital care for the wives and sick infants of enlisted men in certain grades of military service, regardless of their financial need. These funds are administered by the Children's Bureau of the United States Department of Labor through the state health departments. Free obstetrical and infant care are provided with certain fixed payments to physicians and hospitals made through the health departments. By December 1, 1943, every state in the Union was participating in this plan to care for the wives and infants of service men. The first federal appropriation for the emergency maternity and infancy care program was \$1,200,000. This was in March, 1943. Since that time additional appropriations totaling over \$23,000,000 in 1943-

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44, and over \$42,000,000 for 1944-45, have been made. Through August of 1944, 486,758 cases were cared for from this fund. This emergency maternity and infancy care program has been designated as a part of the national defense program and will continue only for the duration of the war and six months thereafter. Even though only a temporary war measure, it is a significant indication of the concern of the people of this nation for the health and welfare of the children of the country.

The federal legislation and appropriations referred to represent only the specific legislation for maternal and child care which is but a part of the work of the federal government for the improvement of the health of children. The appropriation for general public health work under Title VI of the Social Security Act, funds spent for the expansion and improvement of day nurseries under the Lanham Act, the aid given in the provision of school lunches for children, are but a few examples of supplemental aids to child health made by the federal government. The large sums of money spent by states and local communities in addition to the federal appropriations are evidence of the change in the thinking of the people of this country since the last war about their responsibility for the welfare of our children.

What evidence is there that these vast sums of money which have been spent have been effective in improving the health of the mothers and children of this nation? Some people would have us believe that the rejection for military service in the present war is evidence that there has been little or no improvement in our national health. Any comparison of rejections for military service in the present war with those in the last war cannot give a true picture of the health status of the nation, as the Army standards differ so greatly now from those of 1917. The only accurate index to show what has been accomplished is a study of the mortality rates.

The birth registration area in the United States was formed in 1915. Since infant and maternal mortality figures are based on the number of live births, no data are available prior to the formation of the birth registration area (Fig. 1—Infant Mortality Rates). In 1915 the infant mortality rate in the registration area was 100. There has been a gradual but steady decline in the infant mortality rate since that time. The latest provisional figure for the year 1943 gives a rate of 39.9, one of the lowest of any of the countries of the world.

The most important causes of infant deaths are prenatal and natal causes, respiratory diseases, gastro-intestinal diseases, and the communicable diseases. Fifty-eight per cent of all babies who die under one year of age die from prenatal and natal causes. The large proportion of deaths from prenatal and natal causes occur during the first month of life, with about half of them due to prematurity. While the reduction in the infant death rate in general has been very marked, there has been very little reduction in deaths due to premature birth, birth injuries and other prenatal and natal causes. Better provision for the care of the premature infant and better obstetrical care can do much to prevent this loss of life.

Twenty-five years ago gastro-intestinal diseases stood in second place as a cause of infant deaths. During the

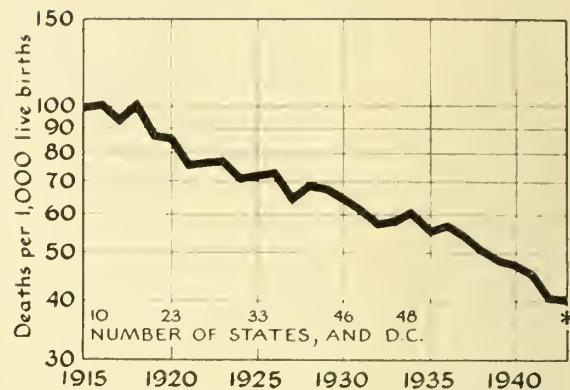


Fig. 1. Infant Mortality Rates—United States Expanding Birth-Registration Area, 1915-1943.

*Provisional figure.

hot summer months the death rate from diarrhea and enteritis rose rapidly, and doctors and mothers alike feared the so-called "summer complaint" or "summer diarrhea." At the present time infant deaths from gastrointestinal diseases are little if any greater in the summer than in the winter. Supervision of milk and water supplies and education of the mothers in the preparation of infant food have all but eliminated the dangers from this type of infection.

There has also been a marked reduction in infant deaths due to the communicable diseases, due to improved methods of immunization.

A general study of mortality rates, however, does not give the whole picture of what has been accomplished or what the needs are. All children in the nation do not have an equal opportunity for survival or for health. In 1940 the infant mortality rate for negroes was 72.9 compared to 43.2 for whites. Likewise, the infant death rate in rural communities was definitely higher than that in the cities. Poverty, over-crowding, availability of medical service, and many other social and economic factors are directly related to the health of the child. Therefore, the medical aspect of child care is only one of several that must be considered in planning a program for the improvement of child health.

Before 1930 the United States had one of the highest maternal mortality rates of any country in the world and there had been no reduction in it during the preceding fifteen years. (Fig. 2—Maternal Mortality Rates). Since 1930 there has been a sharp downward trend in maternal mortality. In 1930 the rate for the United States was 66, while the provisional figures for 1943 give a rate of 24. This saving of mothers' lives has been due to better prenatal and obstetrical care. The public health agencies have taught the public the necessity of seeking medical care early in pregnancy. The medical profession has taken the leadership in calling to the attention of the profession the need for better obstetrical care. A survey of maternal deaths in New York City, made by the New York Academy of Medicine a few years ago, placed the responsibility on the physicians in 65 per cent of the cases studied. This study, as well as similar ones made by other medical groups, has done much to im-

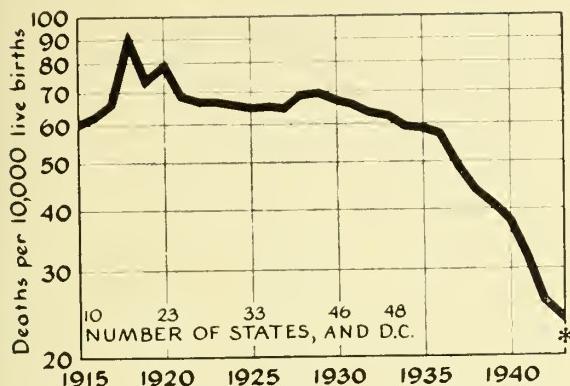


Fig. 2. Maternal Mortality Rates—United States* Expanding Birth-Registration Area, 1915-1943.

*Provisional rate for first 9 months of 1943.

prove maternal care and obstetrical practice in this country.

Although the maternal death rate has been sharply reduced, between 60 and 70 per cent of these deaths still are due to preventable causes. Infection is still responsible for about 40 per cent of all puerperal deaths, and the toxemias, approximately 25 per cent. Over one-third of the deaths that occur from puerperal infections occur during or after abortion. The use of the sulfonamide drugs has been a factor in reducing maternal deaths due to infections and will undoubtedly cause a further decline.

As in the case of infants, maternal mortality is higher in rural areas than in the city, the comparative rates for 1940 being 34 per 10,000 live births for the urban and 40 for the rural. Likewise the maternal mortality rate

among negroes is more than double that among the whites. Better provision for medical and hospital care in the rural areas and certain parts of the south must be made if these conditions are to be changed.

A continued reduction in infant and maternal mortality during the years of the war with the shortage of hospital and medical facilities in many communities speaks well for the public health and medical professions of the country. However, although mortality rates have declined, they have not yet reached the irreducible minimum, since mothers and infants continue to die from preventable conditions.

Continued national planning and the cooperation of the medical, social, and public health agencies will save more lives and improve the opportunities for better health for future generations of children. Sir Arthur News-holme, late medical health officer of Great Britain, said more than 20 years ago: "Infant mortality is the most sensitive index we possess of social welfare. If babies were well born and well cared for their mortality would be negligible. The infant death rate measures the intelligence, health and right living of fathers and mothers, the standards of morale and sanitation of communities and governments, the efficiency of physicians, nurses, health officers and educators."

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The Improvement of Health through Better Nutrition

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NUTRITION is the science of food and its relation to health. It is one, and only one, of the many environmental factors affecting health, but it is certainly fair to say that nutrition is one of the most important factors concerned with health. Whenever man has consumed food in such variety and quantity that all nutritional needs of the body are fully met, he has been well nourished and is generally in improved health.

The general thesis of improved health through better nutrition is supported by numerous examples that can be drawn not only from the history of mankind, but from well planned studies on small and large groups of people, from everyday experiences in any hospital, or from many investigations with a variety of animals. A few of these studies will be briefly mentioned in this paper.

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McCarrison (1922, 1932) in studies on two tribes in India found unmistakable evidence of improvement of health through better nutrition. In one of his papers he says: "For nine years of my professional life, my duties lay in a remote part of the Himalayas, where there are located several isolated races, far removed from the refinement of civilization. Certain of these races are of magnificent physique, preserving until late in life the characteristics of youth; they are unusually fertile and long lived, and endowed with nervous systems of notable stability. These people live on a very frugal diet, apricots, vegetables, goat's milk and butter—whole grains and meat only on feast days."

Then McCarrison studied a tribe in the south of India where the diet for generations had consisted of polished grains, vegetable fats, little milk, no meat, and few vegetables. The stature of this tribe was stunted, illness was

common, mortality high.

Now obviously there were genetic differences between these people, and contributory environmental factors other than nutrition. But following his observations of these two tribes, McCarrison took a thousand albino rats and fed them for two and one-half years on a mixed diet representative of one tribe. Another thousand rats were fed the diet of the other tribe. The differences found were even more striking with the rats than they had been between the tribes. It is of interest that this classic experiment was repeated on rats only a few years ago by another investigator, and essentially the same results obtained.

Orr and Gilks (1931) conducted a study of two South African tribes with a view to possible improvement of physical efficiency through improved diet. These tribes live in regions which do not differ as to climate and agricultural possibilities. The males of one tribe average 5 inches taller and 23 pounds heavier than corresponding subjects in the other tribe. Muscular strength was found by dynamometer tests to be 50 per cent greater in one tribe. There were marked changes in the height and weight of the women of the two tribes. But the most striking differences occurred among the children. Of the children up to eight years of age, both girls and boys, three-fourths of them in one tribe were graded as in good physical condition, and in the other tribe only one-fourth were graded in good physical condition. Skeletal deformities, dental caries, spongy gums, anemia, diseases of the skin, and tuberculosis were rare in one tribe, and most common in the other.

There were undoubtedly genetic differences between these people, but there were also significant dietary differences. One tribe consumed large quantities of milk, meat, and blood. The other tribe, while they raised large herds of goats, treasured them as wealth—not as food. They lived mostly on cereals and roots.

The classic study of Dr. Correy Mann (1926) on English schoolboys should certainly be mentioned in any discussion dealing with nutrition and improved well-being. The investigations were carried out over a four-year period on approximately 200 boys of six to ten years of age. They show clearly the value of extra milk in improving health on diets which were thought to fulfill all nutritional needs. Those on the best diet—the basal diet plus a pint of milk per day—gained approximately 7 pounds per year as compared with 4 pounds per year on the control diet; the better fed group also grew taller. Throughout the four-year period, there was striking improvement in general fitness, fewer upper respiratory infections and other illnesses, and improved mental capacity. Dr. Mann states that these factors are difficult to measure and evaluate, but emphasizes that an impartial observer had no difficulty in pointing out quickly which were the boys receiving the improved diet.

Interesting observations on diet and disease among the whites and the Negroes of South Africa have been reported by Gilbert and Gillman (1944). Cirrhosis and carcinoma of the liver, and tuberculosis are far more prevalent among the Negroes, whereas gallstones, diabetes, and peptic ulcer are infrequent. Such difference in

incidence of disease is undoubtedly related in part to racial characteristics and poor sanitation, but in addition, Gilbert and Gillman have considered nutritional status as a possible factor and present some experimental evidence to support this point. The Negro is poor and lives largely on corn. Meat and milk are rarely consumed; as a consequence, deficiency diseases are widespread. The effect of the typical Negro diet on animals was tested over a two-year study period using albino rats. As was to be expected, growth was poor in the test animals as compared to the controls receiving a mixed diet. After 15 months, the test animals had lost much of their hair, their corneas were scarred and filled with capillaries, and numerous dental defects had occurred. On autopsy, liver lesions were present without exception. The testes of all male rats were extensively damaged. In many animals hypertrophy and hemorrhage of the adrenals were present. Atrophy of the thyroid was common while the parathyroids were usually enlarged. The parotid was always damaged while the pancreas was affected in a majority of the animals. Cardiac enlargement was present in those rats with extensive liver damage. In general, the observations were not those of any specific disease but rather of what might be expected as the result of chronic multiple deficiencies and as secondary manifestations of the extensive liver changes.

This simple experiment (and there have been others like it) demonstrates the possibility that long continued poor nutrition may indeed have a close connection with many disease syndromes that are common in any hospital today. It would indeed be unwise to dismiss nutrition as a factor in the cause or progress of most of the chronic diseases, especially as they occur in malnourished groups.

Perhaps the most striking illustrations of the improvement of health through better nutrition are to be found in studies on prenatal nutrition in relation to maternal health, fetal development, and the health of the offspring. This work has been well reviewed in a recent publication of Burke (1944). The classic study in this field is that of Hart and associates (1911) at the University of Wisconsin Agricultural Experiment Station on the effects of different rations upon growth and reproduction in the cow. Corn-fed heifers gave birth to full term vigorous young, normal in size and able to stand and suck within an hour after birth. The young from wheat-fed heifers were born prematurely, were small, and either were stillborn or died within a short time. It was shown later that the wheat plant ration could be made adequate by the addition of bone meal and cod liver oil (Hart, McCollum, Steenbock and Humphrey, 1917).

That the diet of the mother may be partly responsible for congenital malformation of the young has been suspected for a long time. In 1921 Zilva, Golding, Drummond and Coward reported that sows fed a diet deficient in vitamin A gave birth to young pigs in which malformations were frequently present. Later Warkany and associates (1940) made studies on nutrition as it affects congenital deformities in the rat. The deformed offspring showed cleft palate, shortening of the tibia, mandible, fibula, radius, and ulna, and fusion of ribs, fingers

and toes. The same characteristic pattern of malformation was noted in three different strains of rats, and could be prevented either by feeding an adequate stock diet or by adding 2 per cent of pig liver to the experimental diet. The defective diet apparently caused no great damage to the adult females, for after producing abnormal young they could be mated again, and if the liver supplement was fed, give birth to normal offspring. A more recent paper from Warkany's laboratory (1944) has shown that riboflavin is the nutrient the lack of which gives rise to these abnormalities. The means by which riboflavin affects skeletal growth are as yet unknown. It also remains to be seen whether diets with a certain degree of deficiency in other nutrients may not give rise to congenital defects.

Numerous reports (Burke, 1944) are available of damage to the human fetus from inadequate nutrition during the prenatal period. Many of these reports relate to fetal rickets, others to keratomalacia and high infant mortalities in offspring from anemic mothers.

More recently there have been a number of studies on groups of pregnant women which have included nutritional as well as medical observations. Most of these have shown rather strikingly the importance of nutrition to both mother and fetus. The paper of Ebbs, Tisdall and Scott (1941) was one of the first to arouse interest. They report as follows: "The prenatal diets of 400 women with low incomes were studied. One group found to be on a poor diet was left as a control, a second group on a poor diet was improved by supplying food during the last three or four months of pregnancy, and a third group found to have moderately good prenatal diets was improved by education alone. During the whole course of pregnancy, the mothers on a good or supplemented diet enjoyed better health, had fewer complications, and proved to be better obstetrical risks than those left on poor prenatal diets. The incidence of miscarriages, stillbirths, and premature births in the women on poor diets was much increased. The incidence of illness in the babies up to the age of six months and the number of deaths resulting from these illnesses were many times greater in the Poor Diet Group."

Burke's (1943) nutrition studies during pregnancy are important. These are part of the researches that the Department of Maternal and Child Health at the Harvard School of Public Health has been conducting on the growth and development of the well child. These investigations are of interest in that they go back over a period of twelve years. All of the children in the study, of which there were originally 324, have actually been studied from birth, and before birth by antepartum studies on the mother. The complete studies include not only detailed and carefully conducted nutrition histories, but also obstetric, pediatric, roentgenologic, dental, anthropometric, psychologic, and some laboratory studies.

In one of these papers, studies are reported on 216 women and their infants, using the oldest sibling in each family. These have shown a statistically significant relationship between antepartum diet and the condition of the infant at birth. In these 216 cases, every stillborn

infant, every infant who died within a few days of birth with the exception of one, the majority of infants with marked congenital defects, all premature and all "functionally immature" infants, were born to mothers whose diets during pregnancy were very inadequate. From this study, it would appear that if the mother's diet during pregnancy is excellent, her infant will in all probability be in excellent physical condition.

As in the study of Ebbs, Tisdall and Scott, a significant relationship was found to exist between the prenatal diet and the course of pregnancy. The findings with regard to eclampsia were most striking. In these 216 women there were 29 cases of eclampsia of varying degree. There was no incidence of eclampsia in those women with good or excellent diets; most of the cases of eclampsia were in those on poor diets, a few in the fair diet group.

In another paper of this series Burke (1943) reports a relationship between the protein content of the mother's diet during pregnancy and the length of the infant at birth. This increase in birth length can be demonstrated with each 10 gram increment of protein in the mother's diet. For practical purposes, this study indicates that less than 75 grams of protein daily during the latter part of pregnancy results in an infant who will tend to be short, light in weight, and most likely to receive a low pediatric rating in other respects.

Certainly the improvement of maternal and infant health through better nutrition is of such a striking degree that every maternal and infant welfare station should be aware of the benefits to be derived from better nutrition.

No review on the improvement of health through better nutrition would be complete without mentioning the long-term studies which Sherman and his students (1943) have been doing with rats. These studies have advanced the principle which Dr. Sherman refers to as "the nutritional improbability of what some consider the normal." These animal feeding experiments have been carried on for many generations and with a rigorous regard for exactness. The basal diet used by Dr. Sherman in these studies consisted of one-sixth dried whole milk and five-sixths ground whole wheat plus salt and distilled water. Such a diet reared rats successfully through several generations. Merely increasing the proportion of milk greatly improved what could be considered the normal for the rats receiving less milk. Rate and efficiency of growth were increased, as were average size, time required to reach maturity, time of full adult capacity, vitality as indicated by success in the launching of successive generations, and actual length of life.

Better nutrition is of importance in the improvement of the health of the acutely ill individual, particularly during the period of convalescence. Examples of this can usually be found on the wards of any hospital. The following is a typical case history:

J. P. (Med. No. 65543), a 51-year-old male, entered the hospital for the first time with the complaint of high fever of one week's duration. Ten days prior to admission, the patient began to have a mild nonproductive cough. He then developed a temperature elevation to 102°, associated with chills and marked

malaise. He was treated at home with sulfamerazine with some improvement. The drug was discontinued two days later. Shortly thereafter, he again developed fever, chills, and malaise. They became more severe and his condition did not improve with sulfamerazine. In the hospital the diagnosis of lobar pneumonia, right lower lobe (type 7 pneumococcus-sulfamerazine resistant) and toxic auricular fibrillation was made. The patient was treated with type 7 anti-pneumococcus serum. There was little or no response. The pneumonic process spread to other lobes and on the ninth hospital day penicillin therapy was begun. There was a prompt response of his fever to levels of approximately 100°. He then developed a pleural friction rub and ran a persistently elevated fever. The patient remained critically ill. At the time of admission, he appeared well nourished, but during the long period of acute illness, the patient had received little nourishment other than glucose and saline infusions and whole blood transfusions. Serum albumin had fallen to 2.6 grams per cent and he developed a mild degree of anasarca. On the twenty-first hospital day, tube feedings were started. He was given a nutritious tube feeding mixture (Stare and Thorn, in press) which supplied daily 3000 calories, 125 grams of protein, and high levels of the various vitamins. There was a remarkable improvement in the patient's general condition. Tube feeding was discontinued after a few days, when his appetite was sufficient to ensure a good food intake. Resolution of the pneumonia began. The patient showed steady improvement. On the thirty-fifth hospital day, the serum albumin was 3.1 grams per cent. He was discharged on the forty-second hospital day.

This case history is of interest in that it illustrates that better nutrition, along with other therapy, was important in improving health.

The war has focused attention on the critical importance of nutrition in convalescence. This is well illustrated by several special studies that have been undertaken on various aspects of this problem and by a recent report of the Committee on Convalescence and Rehabilitation of the National Research Council (1944). The importance of good nutrition from the viewpoint of preventive medicine is emphasized. Optimum nutrition is one of the most important aspects in the general treatment of convalescence and rehabilitation.

In the few studies that have been briefly mentioned, most of which were done on human subjects, there seems to be good evidence that nutrition is a major factor in general health, in the health of the pregnant woman and her offspring, and in medicine, both preventive and curative. But is this knowledge of nutrition actually used to full advantage in medical and public health teaching and practice? I do not mean used merely by the professionally trained nutritionists attached to the community or state health departments, but really used by the physicians actually treating patients and doing or directing public health work. It would appear that applied nutrition in public health and medicine is not secondary in importance to epidemiology, sanitation, chemotherapy, etc. It is of equal importance—but is it given equal rank and support? Why does nutrition make up a very minor part in most courses in public health or preventive medicine given to medical students? Why is it that in most public health schools and departments, nutrition teach-

ing and research generally occupy an inferior position as compared with epidemiology or sanitary engineering? Why is it that in the curriculum of most American medical schools, nutrition teaching and nutrition research generally occupy a minor place?

The answers to some of these questions are provided in that nutrition is a relatively new science—really a twentieth century development of chemistry and physiology. Medicine is much, much older. It takes time for new principles to be adopted, unless—and this is important—there is a finding with dramatic results to a specific disease. Medical training, thought, and environment in the clinical sciences is in terms of disease, diagnosis, pathology, bacteriology, and wishful hopes, or justly proud admiration of dramatic cures—not in terms of health, of preventive medicine, of longtime results.

Nutrition is not a panacea for man's ills, but it deserves equal rank with the other environmental factors affecting man's health and welfare. It should, therefore, be equally acknowledged in the educational and practical aspects of health and medical programs, as well as in research programs. Only through research will we someday discover why this or that nutrient is necessary in the complicated and dynamic myriad of chemical reactions which constitute the metabolic activity of the cell and which affect health so pointedly. In the practical improvement of health through better nutrition, three main factors need to be stressed: (1) an appreciation of what good nutrition can contribute to health; (2) a working knowledge of what constitutes a healthful diet at the different stages of life; and (3) economic ability to provide a nutritious diet. For most of us better nutrition means improved health and happiness.

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Organization for Medical Care

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GENERALLY speaking, "organization for medical care" has a much more precise meaning to the public than it has to the medical profession. And this in spite of the fact that the profession has stated numberless times that it is the major, if not the only, group in the country that has the experience and the information to solve the problems of medical care.

To the public, expressing itself with the dogmatic finality that usually accompanies the voice of experience, organization for care means relief from the burden of costs. To interpret this as a demand for a decrease in the total costs of more services gives the public little credit for any intelligence. What is demanded primarily is a way to protect the individual from the catastrophies of medical costs.

How has the professional leadership faced this relatively simple objective? First, by a rather grudging agreement that the public has a problem. The agreement is implicit in the widespread professional discussion of medical plans and in the actual development of plans that are available to a percentage of the population. Second, by discussions, interpretations and charges that are utterly bewildering to the public and only a degree less so to the profession itself. The result is a text on "How to Lose a Debate."

There is enough in the Wagner-Murray-Dingell bill to question or criticize objectively without insertions of thoughts and intentions between the lines. And such questioning or criticism would probably be as welcome to the authors of the bill as to anyone. Setting up personalities as targets creates nothing but uncompromising animosities. Nor is anything gained by adopting the role of prosecution or defense and attempting to rule out all testimony favorable to the other side. It is true that neither "side" in the debate has any monopoly on such practices but the discussion here is concerned with the position of the profession in the organization of medical care.

To anyone occupying a ringside seat the arguments have their elements of absurdity. Take the phrase "socialized medicine" which is tossed about as though it has one exact meaning for everyone who uses or hears it. The person who says that socialized medicine, *per se*, is bad convicts himself of a peculiar type of blindness. He is unable to see the accepted forms that function all about him—mental and tuberculosis hospitals, health department attacks on specific diseases, industrial medical services, prepayment plans, group practices, medical education, and other examples. Among these there may be cited cases where the manner of operation is unsatisfactory but that subject has nothing to do with socialized medicine as a device where a group of people, professional or other, undertake to do something in a better way than it can be done by each individual who makes

up the group. To say, therefore, that a state or local medical society should organize and operate a prepayment plan and, at the same time, to deliver a diatribe against socialized medicine is like suggesting that a person in Chicago be in New York and San Francisco at 10 o'clock on the same Tuesday.

There is general agreement that any organization of medical care should offer a protection against "catastrophic illness." The phrase is very impressive to the ear but its impression on the mind is another matter. Considered by itself it has as much meaning as a discussion of "adequate" income without relating income to the cost of living. A catastrophic illness may mean to one family *any* illness that calls for *any* expenditure; to another it may mean as many as five home and office calls; to a third it may mean the combined costs of the physician's services, the nurses', the hospital's, and other care.

Adding least of all to any intelligent approach to solutions are the publicly-airied opinions on what must be, to the public, quarrels between experts on minute and technical details: fee-for-service vs. capitation or some other method of payment; is it health insurance or is it sickness insurance?; is American medicine the best in the world and why?—these and others of what must appear to be matters beside the point are spread before the public. And the public is expected to respond and decide!

Lastly there are the personalities. This part of the Great Debate is the one most emphasized; the tactic of attacking personalities is old and widespread. Who started it is of no importance now; what is important is who will stop it in the interests of a more sane approach. The point has been reached where catch phrases, clever sayings and barbed charges have almost, if not fully, run their course. To say, for example, that no one should hold an opinion on medical care until he has been "called at 3 A.M. to deliver a baby" is a sophomoric argument. It carries about as much weight as would the statement that no one should hold an opinion on the subject without staying up until 3 A.M. to have a baby, and then pay for it.

Maybe now would be the time to tell the public about that old Greek practice of ostracism, the banishment by popular ballot of public figures who had debated an issue too nimbly, too minutely, and to a point where the public had become a bit tired and wanted something done.

The most valuable element that the profession might contribute to the whole subject, both for the sake of the profession and the public, is the one of logical approach to an understanding of the problems. The procedure, "examination, diagnosis, treatment," is as old as medicine and as modern as the current minute. To diagnose without adequate examination or to treat without such a diag-

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nosis is permissible only in the most pressing and unusual emergency. But when it comes to the organization of medical care most of the concentration is upon the treatment or plan and only minor attention is given to examination and diagnosis or to the nature of the problem itself.

Again, there is a tendency to confuse principles with administration. Probably it is this tendency that is responsible, more than any other, for the usual professional response to "socialized medicine." What the individual has in mind is not the principle but the specific way that it is applied, or is said to be applied. But this reasoning is comparable to saying that surgery is bad because a particular surgeon is inept or a particular technique is not effective.

Perhaps the time has arrived for the profession to issue and distribute a booklet to guide its membership and to inform the public on the subject—not a ponderous treatise filled with impressive resolutions and sets of broad principles, but a simple booklet that is as direct as the shortest distance between two points. Call it "How to Recognize a Plan Sponsored by the Medical Profession."

Part I of the booklet should present the criteria or the marks of Medical Soundness. Does the plan provide the best services in the community to the subscribers? Is there a special effort to emphasize the preventive aspects of the service? Does the plan violate medical soundness and good medical practice by withholding antepartum and postpartum care from maternity cases? These are a few of the many questions that involve medical soundness. The questions and the answers should be presented in the booklet.

Part II might deal with Social Soundness. Is the plan a solution or is it an instrument of defense? How whole-hearted is professional support? How many people are included and what are the efforts to include all of those for whom the plan is intended? Is there active research—research, not just declarations—on the ways and means of extending more services to more people?

Again, the booklet would raise questions and answer them or indicate by examples how each might be answered.

Part III would offer guidance on Economic Soundness. How might "reasonable costs" to the subscriber be defined? Does the plan offer specific economic protection

to the subscriber? Has the plan provided specific and reasonably satisfactory economic benefits to the physician? Have subscriber rates been increased and why? These are a few of the many questions that touch upon economic soundness.

Part IV should present the too-little emphasized subject of Administrative Soundness. A few of the questions might be: Who actually operates the plan? Are there adequate administrative controls? Are artificial barriers created between potential patients and services? Is the plan conceived as a business owned exclusively by the profession? Are proposed expansions the result of pressure? What types of educational programs are there for the profession and the subscribers? What are the evidences of sound growth?

Finally, a glossary of terms and words should complete the booklet. The definitions should include socialized medicine, state medicine, government medicine, red medicine, physician-patient relationship, group practice, adequate medical care, health insurance, free choice, fee-for-service, capitation fee, curative medicine, preventive medicine, voluntary plans, compulsory plans, gradual evolution, etc. Probably the glossary would do more than anything else to sharpen the thinking on the whole subject of medical care.

It has been said time and again that the public would welcome the leadership of medicine toward a solution of the problems of medical care. There is little doubt, too, that the members of the profession, the practitioners who serve and are close to the people, would welcome the leadership of their leaders toward the same end. Here, then, is accord, much more accord between practitioners and public than is usually thought to exist. Thus, the responsibilities of medical leadership become more weighty as the judgments of those who are led become more critical. Perhaps the time is ripe for another booklet to be prepared by practicing members of the profession who hold no office. Call it "The Qualities of Medical Leadership and How They May Be Judged."

Obviously what has been said is no neat blueprint for a very brave and a very new plan to organize medical care. Nor was that the purpose. The hope is that the tactics of the pre-Queensbury prize ring will be replaced by those that grow and develop in a different atmosphere—that created by the conference room and the wish and the will to solve a problem.

GRADUATE TRAINING IN PHYSICAL MEDICINE

The Regents of the University of Minnesota recently accepted a special gift of \$40,000 from the Baruch Committee on Physical Medicine for the support of graduate training in this important and rapidly expanding field. For a number of years a course for the training of physical therapy technicians has been conducted by the Medical School and a similar course for the training of occupational therapy technicians is under consideration. The grant from the Baruch Committee will supplement the training program for technicians and will be used to provide certain additions to the teaching staff and fellowships for physicians to be trained as specialists, with special emphasis on teaching and investigation, in this field. This program will be closely integrated with the research program in physical medicine which is being supported by a five-year grant from the National Foundation for Infantile Paralysis.

Health Education

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HEALTH education has for its objectives: to create a desire for good health, to increase the general knowledge concerning disease prevention and health conservation, and to improve health habits and sanitary practices. Though health education efforts are carried on at all ages and in a variety of places they can be generally comprehended under the four titles, Home Health Education, School and College Health Education, Public Health Education, and Professional Health Education. In the past 75 years, development has been rapid in all four fields and new methods and approaches now make possible continued advancement. The possibilities which lie ahead in health education, therefore, far outrun the limitations of this short paper.

HOME HEALTH EDUCATION

Education of the infant in the home starts as soon as he is born, and though less is written about this type than about the other types of health education, there is no doubt that the most important health education of all is that which is carried on in the early formative years in the home. In this important field the past 75 years have seen tremendous changes. The books on baby care by physicians have to a considerable extent been replaced in the home by books on child growth and development written by nutritionists, health educators,¹ child psychologists and family-life specialists. The concept of the child as a piece of plastic material to be merely shaped, molded, and disciplined into that which the parent visualizes as ideal has been outmoded. And the modern mother thinks of her infant as an individual, different in many respects from all other individuals and given at birth a constitutional make-up and a growth pattern which will unfold day by day in a manner often quite independent of the mother's efforts or desires. Child-study groups for mothers, child-care courses in our high schools and home economics colleges, extension courses, radio programs and regular newspaper columns devoted to the problems of child care, have done much to help mothers provide for their children a physical and psychological environment that is favorable to optimal growth and development. Maternity-nursing centers, baby-health stations and child-guidance clinics have also been of great benefit to mothers, aiding them in establishing a healthful regime for their children.

Evidence as to the great improvement in home health education which has taken place in recent years is provided in the dwindling incidence of rickets in children. While about 90 per cent of artificially fed infants were estimated to have demonstrable signs of rickets in winter and early spring in the early 20's the incidence of the disease in that same group has now been reduced to an estimated 30 per cent or less for "clinical rickets," and less than 15 per cent for "roentgenological rickets."

[†]Bureau of Medicine and Surgery, Washington, D. C.

SCHOOL AND COLLEGE HEALTH EDUCATION

In the 75 years that have elapsed since 1870 the forward march of school health education has also been rapid and commensurate with the advances made in the whole field of education in our schools. Perhaps the most important advancement has been the realization that school health education must be much more than a course and a textbook and that it must be the sum total of all the influences brought to bear on the child in the school to favorably affect the development of proper attitudes, adequate knowledge, and sound health habits.

This shift of emphasis from didactic health instruction to healthful living and learning by doing has not been accomplished easily nor quickly but gradually and as the result of forces being brought to bear from a variety of sources.

To fairly evaluate the part that each of the diverse forces played in the development of modern school health education is a difficult if not impossible task. But to point out the chief contribution of each group and to place it chronologically in the story is a fairly simple task.

The first step toward the new concept of school health education was the breaking away from the traditional idea that the school should limit its functions to the purely intellectual activities and from the old puritanical feeling, expressed in the classical words of Roger Ascham, "running, leaping, and quoiting be too vile for scholars." Credit must be given to the German Turners, Indianapolis Normal, and the International YMCA 1875-1900, to the proponents of the Sargent System of gymnastics 1879-1900, and to the Swedish Gymnastics enthusiasts and Boston Normal 1889-1900, for the partial return of physical activities to the school curriculum. There was nothing really novel in this, of course, since the ancient Greeks in their gymnasiums or palaestrae had provided first for physical training of their youth and secondarily for philosophy and lectures in their porticos. But the revival of the school's interest in physical activities of any sort was a step of considerable importance.

To John Hope in Scotland and the W.C.T.U. in the U.S.A. goes the somewhat doubtful credit for making the teaching of physiology and hygiene (with emphasis on the physiological effects of alcohol) a compulsory part of the curriculum in all public schools. This movement starting with John Hope's weekly visitation of the day schools of Edinburgh in 1852 to deliver temperance lectures, was taken up by the W.C.T.U. in the U.S.A. in 1879 and resulted in compulsory legislation in New York State in 1884. Laws now make such instruction mandatory in the public schools of every state and territory in the U.S.A. In a sense this legislative approach to health education was a retreat and not an advance but it must be admitted that it did demonstrate that

society could utilize the school in the effort to meet a social need whether it be for temperance education, for safety education, or for sex hygiene or nutrition instruction.

The next development, 1874-1894, was to bring the physician into the school and shoulder him with the responsibility for inspecting for communicable disease. This function rapidly extended to the discovery of remediable defects and then to the broader field of health supervision, but the primary contribution of this movement was the new assumption that the school had a contribution to make to the remedying of defects and the improvement of pupils' health.

Though the term "biology" was introduced by Treviranus, 1776-1837, it was not until late in the 19th century that teaching with regard to the structure and functioning of plants, animals, and man began to assume a real place in the college curriculum. It is therefore quite unlikely that biology played an important role in health education in the grade schools much before the beginning of the present century. And when biology did become a popular high-school subject its objective was not so much to improve health attitudes, habits, and knowledge as to "inculcate and ultimately produce a way of thinking characterized, among other things, by (1) the habit of seeking data and analyzing them before drawing a conclusion (2) the habit of testing conclusions (3) the attitude of suspended judgment (4) a desire to get the truth objectively, regardless of self interests." Nevertheless a great deal of the material presented in biology courses through the years has contributed directly to the ends of health education and recent analyses of biology courses and texts reveal that something over 35 per cent of their content has definite health implication.

With the organization of the voluntary public health organizations such as the National Tuberculosis Association and the American Child Health Association, 1908-1912, the approach to health teaching in the elementary schools of the U.S.A. changed radically. Through the efforts of these organizations health instruction became a happy cheerful thing rather than a series of thumb-rules and don'ts; health songs and pictures of healthy, happy children took the place of the lurid illustrations of the gin-drinker's stomach and the bony skeleton; nutrition and health habits received the emphasis formerly placed on the naming of the bones of the body or on the pathological effects of alcohol and tobacco. This movement is accredited with "putting the song and dance into health education," and accused of "making health teaching a clownish business." But whatever its weaknesses were, there can be no doubt that this phase of health education was a movement in the right direction, namely toward healthy, happy living and away from dry facts and pathology. To Sally Lucas Jean and Louise Strahan belongs a great deal of the credit for this development.

In 1922 there was appointed the first Joint Committee on Health Education of the National Education Association and the American Medical Association. Under the chairmanship of Dr. Thomas D. Wood, this tech-

nical committee of 27 specialists set forth the materials of health education for the first eight grades of school and suggested methods to be used and standards to be attained in health knowledge and in health behavior at each level. This report was completed and widely distributed in 1924 and immediately became the basis for most of the courses of study in health education in the elementary schools of the U.S.A. In this report was to be had for the first time a progressive health education program, accurate as to facts and sound as to methods of presentation and to grade placement of materials. Since publication this report has been frequently revised² and has continued to represent the consensus of opinion of physicians and educators, nutritionists and biology teachers, physical educators and dentists, educational psychologists and public-health workers. Though much remains to be done to make this report complete, particularly at the high-school level, the great contribution made by this authoritative program of study in health education is already apparent.

To complete the record of the development of modern school health education one more factor must be mentioned, i. e., child growth and development courses for teachers in training. The past four years has seen the reorganization of many teacher-training courses. The complicated course of study commonly laid down for the training of teachers has been thoroughly reviewed and a somewhat simplified, though longer, course outlined. As a basic part of this plan there is a complete course in sociology to acquaint the teacher in training with the society for which the school must prepare its pupils, and a composite course in child growth and development to make plain how the normal child changes from year to year as he grows and develops and how the teacher can best assist in the development at each stage. Though this is a recent innovation based on needs much broader than those in the field of health education alone it is obvious that teachers trained in this modern way will almost automatically meet their health educational responsibilities more effectively.

As the resultant of all these forces we see present-day school health education^{3,4,5} marked by the following characteristics: it starts early, in the nursery school, and continues late, in high school; it views the whole school day of the child as an educational experience and attempts to make each event, morning opening hour, recess period, mid-morning lunch, visit to the health room, noon-hour, rest period, weighing and measuring, etc., teach its health lesson; it attempts to coordinate the efforts of class-room teacher, school nurse, parents, school physician and family doctor to prevent disease, remedy defects, and adjust the school activities to the needs and capabilities of the individual child; it interests itself primarily in the health habits and attitudes of the child and assures itself that there shall be first the will to learn and then opportunity to learn by doing; it interests itself secondarily in the health knowledge of the child, but it insists that at least some time be regularly set aside each week for hygiene teaching, and that the materials presented be part of a carefully planned and progressive course of study; it assumes that fresh air, adequate heat-

ing, modern toilet facilities, and proper illumination are a vital part of the health educational plan; it recognizes the need of the normal child for physical exercise and recreation suited to his age and development and provides adequately for meeting this need within the school's jurisdiction; it recognizes innate differences in interests and abilities and attempts to provide as adequately for the pupil who terminates his schooling with the 12th grade as for the pupil who is to continue into college.

Educational qualifications for school health educators were tentatively set up by a sub-committee of the American Public Health Association and published in the July 1937 issue of the *Journal of the American Public Health Association*.

Though hygiene teaching has been rather consistently required in the elementary schools it is only recently that extension of this requirement to the high-school level has taken place. The New York State Board of Regents has moved in this direction by recently requiring that hygiene be taught in both junior and senior high schools by teachers with approved preparation. This board also requires that some member with approved preparation be designated as the "health coordinator" in every high-school faculty. This extension of the teaching of health and safety to the high schools of New York State will be accompanied by the provision of one unit of regents credit for the course.

The obvious need for supervision over the health teaching in the elementary schools has been met in certain city school systems by providing either special health education supervisors or general supervisors with special interest in health education. In certain rural areas special health education supervisors have been provided by joint use of state education funds and county Red Cross funds.

Hygiene teaching at the college level has been throughout the period under review, extremely variable.⁶ Required courses in personal hygiene in the freshman year followed by elective courses in succeeding years have been commonly employed. The elective courses most frequently provided have been first aid, school health supervision, industrial hygiene, mental hygiene, rural hygiene, and community hygiene. The use of the motion picture has been rapidly increasing in the teaching of college hygiene and in some colleges, as many as 20 teaching films are used in a term's work of 30 class periods. Recommendations as to the provision of hygiene courses and as to the qualifications of hygiene teaching were made by the First and Second Conferences in College Hygiene^{7,8} held in 1931 and 1936.

PUBLIC HEALTH EDUCATION

The advances which have taken place in the field of public health education have largely occurred in the last twenty-five years. The health educator attending an American Public Health Association meeting before 1921 had no section to attend but was forced to find the health educational contributions wherever they might be scattered through the programs of the various sections. November 1921 witnessed the first meeting of the

A.P.H.A.'s Section on Health Education and Publicity, organization having been effected largely through the joint efforts of Evart G. Routzahn, Dr. William F. Snow, and Dr. Lee V. Frankel. In recent years the name has been changed to the Section on Public Health Education and growth has been steady until at the present time the section numbers over 800 members.

Though health education has been listed for many years as one of the cardinal responsibilities of state and local health departments, the activities carried on under that heading have been until recently quite limited in scope and the training of the personnel manning the health education division or section has frequently been extremely varied and unstandardized.⁹ Since World War I, however, this situation has rapidly changed.¹⁰ Health education divisions in state and local health departments, in national, state, and local medical organizations, in voluntary public health organizations and in private businesses or industries have doubled and redoubled in size,¹¹ and facilities for training health educators have been greatly improved and extended. In a recent article, E. R. Coffey,⁹ Medical Director, United States Public Health Service, stated: "In fact, it has now become apparent that every full-time health unit, as defined by the Committee on Local Health Units, of this association should have at least one qualified full-time health educator."

The growth of health educational activities in the various state health departments since World War I has tended to follow a pattern somewhat as follows. The Health Education Division is first asked to serve as the publication service of the health department and perhaps publish a weekly or monthly news sheet or bulletin. To these activities new ones are quite quickly added and shortly the following services are being provided by the Health Education Division: a news service covering the activities of the entire health department, a motion picture lending library, a radio program, a health library, a health lecture service, a question-answering service. From this level it is but a short step to radio script production, health motion picture production, health poster production, and promotional activities in such fields as nutrition, farm safety, and 4-H Club health program. In the meantime, the requests for assistance from the other divisions have multiplied and the Health Education Division finds itself engrossed in the varied preventive programs ranging all the way from diphtheria immunization to syphilis- and tuberculosis-control programs. In the fiscal year 1943 approximately \$1,200,000 was budgeted for health education by the various states.

It is obvious that this pattern represents a normal and extremely useful development. That it should and will continue is obvious. And to it will be undoubtedly added a similar development among the local health departments which have only begun to really put health education to work except in the larger cities.

At the national level, little was done in health education here in the U.S.A. until the last few years. The advancements made in the last few years have, however, been so sweeping and rapid that much of the lost time

HEALTH EDUCATION			
Type of Health Education	Groups Concerned in Giving Instruction	Groups Concerned in Receiving Instruction	Provided Under Auspices of
PROFESSIONAL HEALTH EDUCATION	University Professors	Medical Students Physicians Health Educators Biologists Nutritionists Public Health Nurses	Schools of Public Health Medical Colleges Schools of Education
PUBLIC HEALTH EDUCATION	Physicians Public Health Nurses Health Educators Nutritionists	The Reading Public Radio Audiences Motion Picture Audiences Employees in selected: Factories, Offices, Sales Groups Recipients of: Health Periodicals Health Pamphlets Nursing Visits Special Health Lectures Special Health Courses	Federal Government State Health Departments Local Health Departments National- State & Local Medical Organizations Voluntary Public Health Organizations Private Business or Industry
SCHOOL & COLLEGE HEALTH EDUCATION	Home-room Teacher Home-room Teacher Health Teacher Physical Ed. Teacher Biology Teacher Prof. of Hygiene Prof. of Phys. Ed. Prof. of Biology	Nursery School Children Elementary School Children High School Students College Students	Nursery School Elementary School High School College
HOME HEALTH EDUCATION	Parents	Infants Pre-School Children School Children	Private Home

has already been made up. Among the health educational projects recently undertaken by the federal government are the following:¹⁰ A health education program under the auspices of the U.S.P.H.S. for all government employees; demonstration in 90 areas in our South on the use of school teachers during their summer vacations for community education in malaria control; the appointment of eight specialists to promote the education of food handlers in the various U.S.P.H.S. districts; a program of health education in nutrition first under the leadership of the office of Defense Health and Welfare Services and later under the Food Distribution Administration; the Physical Fitness Program under the leadership of the Federal Security Agency and other federal agencies; a program of health education in the various government housing projects under the Federal Public Housing Authority; the development of special audio-visual training aids for health instruction of personnel by the Army, Navy and Office of Foreign Relief and Rehabilitation Administration.

Outstanding examples of the increasing attention to public health education among the non-governmental agents are the following: the publication of the monthly health magazine *Hygeia* by the American Medical Association; the development of a regular series of health broadcasts by the American Medical Association; the publication of sound and authoritative pamphlets on a variety of health subjects by insurance companies, milk distributors, orange growers, meat packers, canners, etc.; the publication of the weekly periodical *Index of the National Health Library*; the publication of *Credit Lines* as a special department in the monthly *Journal of the American Public Health Association*; the publication of *Channels* by the National Publicity Council; the stepping-up of the program of the National Safety Council; the recent appearance of a new British quarterly, *Health*

Education Journal; the recent development of sections on both health education and school health education in the Office of the Coordinator of Inter-American Affairs with a program for Latin America including demonstration projects and training of workers both in the United States and in Latin America. On October 11, 1944, there was held the first Inter-American Conference on Health Education. From these scattered references to new developments in public health education, it is apparent that World War II has given this public health specialty a meaning and urgency which had been largely lacking previously. All evidence points to a continuation of this movement after the end of the war.

PROFESSIONAL HEALTH EDUCATION

In October, 1914, The General Education Board of the Rockefeller Foundation called a conference of the leading authorities to discuss the need for better facilities for training and research in the field of public health. Following this conference, Dr. William H. Welch and Mr. Wickliffe Rose were asked to draw up a plan for an institute of public health and hygiene. That plan was presented to the General Education Board in May, 1915. The plan was accepted and a committee appointed to determine where such an institute had best be located. Johns Hopkins University was recommended and the offer of the Rockefeller Foundation to provide support for such a school was willingly accepted. Thus, there was opened in October, 1918, the first school of hygiene and public health in the United States.

Other schools of hygiene and public health gradually developed during the next 20 years, not only in the United States, but in Latin America and Europe, several of them under grants from the Rockefeller Foundation. Though the number of these institutions was not large, the contribution made by them to raising the standards

of public health training and performance was enormous. Through them, workers with public health degrees (Dr. P.H., M.P.H., or C.P.H.) began to become available and began to be demanded.

As a part of this same movement, many of the medical colleges began to add courses in public health but as recently as 1934-36, only 18 medical schools in the United States had full-time departments of public health, 25 other medical schools included or combined preventive medicine, public health and hygiene, with bacteriology.¹²

Outstanding in its contribution to the training of health educators throughout the period between World War I and World War II was the Massachusetts Institute of Technology with its courses under Clair E. Turner.

In 1932 or thereabouts, medical schools and schools of public health began to associate with themselves, a district health center in order to provide an opportunity for their students to get practical training in public health work. This, however, was of no great value to students preparing for a career in health education. Actual field work and special field training courses were needed by these professional health educators in training. And in September, 1941, the U.S.P.H.S. in cooperation with the North Carolina State Board of Health, launched the first of a series of demonstrations in community health education in counties with health problems made particularly urgent by the War. In order to meet the demand for personnel which these demonstrations created, several state health departments and the W. K. Kellogg Foundation provided special fellowships which enabled trainees to go for graduate work to the School of Public Health at the University of South Carolina. Another grant from the W. K. Kellogg Foundation to the U.S.P.H.S. has made it possible for Yale and the University of Michigan also to offer this broader training program in health education.¹³

Suggested educational qualifications for health educators were set forth by the committee on Professional Education of the A.P.H.A. in the August 1943 issue of the *American Journal of Public Health*.¹⁴

The Institute of Inter-American Affairs has recently made available grants for health-education fellowships. And in connection with these grants, the recently organized School of Public Health of the University of California is planning to offer a course in health education especially designed to meet the needs of Latin Americans.

SUMMARY

There are four chief types of health education: i. e., Home Health Education, School and College Health

Education, Public Health Education and Professional Health Education.

In all four types of health education, there has been more advancement in the 26 years since World War I than occurred in the 47 years preceding that war.

The problems created by World War II have particularly stimulated the development of public health education and professional health education.

It would appear that World War II has slowed rather than accelerated developments in the field of school health education.

A markedly increased interest in all four types of health education has been evidenced by the Federal and State governments in recent years.

It would appear that health education is destined to play an increasingly important part in the postwar reconstruction period.

Opportunities for the special training of health educators were never so numerous and the needs for such trained personnel were never so great.

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The Office of Medical Information (under grant of the Johnson and Johnson Research foundation) has sent us from the National Research Council four mimeographed reports of great interest. These, entitled respectively *Antimalarial Drugs*, *The Blood Plasma Program*, *Keys to the Mosquitoes of the Australasian Region*, *Spontaneous Pneumothorax*, are all by medical investigators especially assigned to their subjects and are stimulating indications of the sound scientific work in medical fields the war is producing. Copies may be had by writing the National Research Council, Division of Medical Sciences, Washington, D. C.

Changing Attitudes toward Industrial Hygiene

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DURING the past few years the problem of protecting the health of the industrial worker has risen to a position of great prominence. A large number of circumstances have contributed to the intensification of interest in the health of the working man, but chief among them have been two which arise from the increased magnitude of the problem itself. First, modern industry has introduced, in addition to hazards already known, many new factors detrimental to the health of the worker; and second, wartime industrial expansion has focused greater attention upon these factors. But although wartime production always carries with it the large-scale handling of certain new and special materials, its principal effect is actually the accentuation of old problems associated with common substances and processes.

Industrial health problems developed or precipitated by the war have been for convenience classified into three broad categories: those attributable directly to the working environment; those that are the result of the changing nature of the working force itself; and those that originate in the workers' home and community environments.

In the first of these categories are included those problems that arise from the introduction of new materials and materials substituted for products with which industry has already become familiar and for which it understands necessary control measures. As an example, the use of toluol, a solvent until just recently commonly employed in many processes, is now limited for the production of essential wartime products, chiefly explosives. As a result, in many processes benzol, with considerably more toxic properties, is being substituted. Examples like this could be multiplied. New solvents and high-speed degreasers, such as perchlorethylene and trichlorethylene, which require special methods and safeguards in handling, are coming into more widespread use. Many new alloys—containing lead, manganese, magnesium, aluminum—are being employed, bringing with them a variety of harmful effects from toxic dusts, fumes, and gases evolved in their processing. The manufacture of explosives has been attended by dermatitis and toxic effects encountered especially in this industry. These are new problems, associated with new materials.

There is, however, a wide variety of health hazards met with during ordinary times in industry but now accentuated in wartime production. Among these are exposures to metallic fumes and ultraviolet irradiation in welding; to x-rays and radium in the radiographic examination of metal castings; the skin irritant and sensitizing effects of cutting oils, synthetic resins, and other products that produce the dermatitis so commonly seen. These

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are problems of the working environment to which war has given increased importance and to which it has directed increased attention.

There is also in this first category of health hazards a more intangible factor that influences the health of the industrial worker. That factor is fatigue. It is not for the most part, however, a fatigue that results from excessive physical activity, though such activity may be conducive to its production in the heavy industries. It is rather a fatigue that has as its precipitating causes home problems, friction with fellow workers and with management, poor posture, and such unfavorable environmental conditions as poor ventilation, excessive temperatures and humidity, and noise. To eliminate or minimize it, therefore, requires an understanding of a broad range of causes, from engineering to human relations.

Of the industrial problems that have their inception in the changing nature of the labor force itself, the second of our categories, the greatest is that which arises from the increased number of women in industry. Experience with this group of the labor force has shown that women are more susceptible than men to certain occupational diseases, and in addition that there is among them a higher incidence of non-occupational illnesses. Wartime labor shortages have also placed in industry another part of the labor force that brings with it special health and safety problems—the group composed of young adults, the aged, and the physically handicapped. Young people are prone to take chances, and so have accidents, while higher sickness rates characterize the older group. The problems of the physically handicapped make necessary a variety of special considerations in placement, protection, etc.

Typical of problems in the third category, those stemming from the community environment, is housing. In certain parts of the country where large cities have sprung up on the sites of small villages, serious situations have developed, and the extent to which they are solved has a direct bearing upon the health of the industrial populations involved. In some of the north central states, however, such as Minnesota, comparatively few new or expanded industries have sprung up in purely rural areas. Here almost all of the large war industries are situated near large cities, which have been able to absorb the new population and fulfill its housing needs. There have been, however, serious problems relating to water supplies and waste disposal resulting from industrial expansion.

Part of the increased attention that has been focused upon industrial health problems, the second of the factors that have given to industrial health its present prominence, has come about through the influence of governmental agencies. These agencies have for a long time recognized its importance; the present war has merely given additional impetus to activities already well organized. Dur-

ing World War I, the United States Public Health Service formed a section on industrial hygiene; since that time, industrial hygiene units have been established in thirty-eight states, six cities, two counties, and two territories. Many of the later states to form units have received through the United States Public Health Service financial aid from funds made available under Title VI of the Social Security Act. Governmental aid and advice on the national level has thus pointed up the problem and helped stimulate activity toward its solution.

At the state level, it is the province of industrial hygiene agencies to assist industry in the appraisal and control of industrial health hazards, through the provision of medical, engineering, and nursing advisory services. Typical of the programs of most such agencies is that of the Division of Industrial Health of the Minnesota Department of Health. Its purposes and functions are:

1. To receive and investigate reports of occupational disease.
2. To promote more adequate medical services within industry, such as the employment of full-time or part-time physicians and nurses, the provision of properly equipped first aid rooms, and the maintenance of sickness records.
3. To encourage the use of ethical pre-employment and periodic physical examinations.
4. To confer with industrial physicians in regard to special problems or general industrial health programs. Special blood and urine analyses for evidence of industrial intoxication are done when warranted.
5. To provide engineering personnel who are specially trained and equipped to make studies of plant environment (e. g., air analysis for toxic vapors, gases, and dust, in effort to determine whether the working atmosphere is safe or otherwise) and to make recommendations for the control of health hazards found. These studies are made at the request of physicians, plant management, the State Department of Labor and Industry, and others concerned with the health and welfare of the industrial worker.
6. To promote within industrial groups adult hygiene programs, such as the control of tuberculosis, syphilis, and other communicable or preventable diseases.
7. To prepare and disseminate information on various toxic materials and processes, and methods for their control.

Evidence that such programs have merit and are well received by plant management is the fact that in some states requests for services of the industrial hygiene agency have been so numerous that it has been necessary to schedule them several months in advance.

Another important factor that has contributed to the augmented attention accorded industrial health problems is the changing attitude of modern plant management. Increasingly, management has come to recognize its responsibility in the protection of the health of the working population. It has also experienced growing awareness of the fact that illness is the greatest cause of employee absenteeism, and so of interrupted production. An additional stimulus to management has been workmen's

compensation legislation, with its tendency toward broad coverage of occupational diseases. Various private agencies, such as the National Manufacturers' Association and the Industrial Hygiene Foundation, must be given credit for their part in this movement.

Corollary to its growing recognition of responsibility for the worker's health, management is increasingly acknowledging this responsibility through the provision of plant medical programs. This is true for the small plants as well as the large, and it has necessitated the formulation of principles for adequate medical service in plants, principles embodying features that in their essentials are as compatible with a plant service consisting only of an efficient and alert nurse or part-time physician, as well as with more complicated organizations. The American College of Surgeons[‡] has tabulated these features of a plant medical service as follows:

1. A definitely organized plan for the medical service.
2. A definitely designated staff of qualified physicians, surgeons, and attendants.
3. Adequate emergency, dispensary and hospital facilities.
4. Pre-employment and periodic physical examinations, to be made only by qualified medical examiners.
5. Efficient care of all industrial injuries and occupational diseases.
6. Reasonable first aid and advice for employees suffering from non-industrial injuries and illnesses while on duty. For further professional care such employees should be referred to their own private or family physicians.
7. Education of the employee in accident prevention and personal hygiene.
8. Elimination or control of all health hazards.
9. Adequate medical records, accessibly filed in the medical department under responsible medical supervision.
10. Supervision of plant sanitation and all health measures for employees by the physician or surgeon in charge.
11. An ethical and cooperative relationship with the family physician.
12. The use of approved hospitals.

Such medical programs have put into effect many of the principles of preventive medicine and public health. And management is already realizing significant returns in the reduction of general absenteeism, occupational disease, employee turnover, and insurance costs, together with an improvement in employer-employee relationships. Within this field management has thus become the ally of preventive medicine.

The medical profession itself, as well as plant management, has been keenly aware of the importance of protecting the health of the wage earner. In 1937 the American Medical Association established its Council on Industrial Health, and since that time many state and county medical associations have formed committees on

[‡]Newquist, M. N.: *Medical Service in Industry and Workmen's Compensation Laws*. Chicago, American College of Surgeons, 1938. Page 3.

industrial health within the structures of their own organizations. Physicians have begun to appreciate the opportunities afforded them in ethically managed industrial health programs, and they are coming to realize that mutual benefit can be derived from proper relationships between industrial physicians and private practitioners.

Directly attributable to this interest upon the part of the medical profession is the tendency of its members to advocate and seek specialized training for industrial health work. The scarcity of medical personnel possessing understanding and training in the problems peculiar to industry has been an impediment to progress. An encouraging note, however, is that a committee representing the American Medical Association's Council on Industrial Health and Council on Medical Education has been established to study this need. This is very significant and salutary. It is at the present time leading to the formation of policies in medical education, and to the study of how these policies can be carried into effect in the medical curriculum. Much of this work still lies in the future.

It seems justified to predict that there will be no decline in interest in industrial health problems in the years that lie ahead. It is certain that in the period of recon-

version and in the postwar era many new materials and processes will find a place in peacetime manufacture, as they have in wartime. Light metal alloys, synthetic rubber, and plastics will come into more general use, and welding operations will be carried out on a larger scale than formerly. Furthermore, the employment of the returning serviceman and the rehabilitation of the physically handicapped will present new industrial health problems.

To the public health agency it is manifest that industry presents a series of organized groups of adults through which preventive medical measures can be promoted with practicality. To both management and labor the mutual advantages of good industrial health programs have been so well demonstrated that these programs will not be discontinued. Management can evaluate its benefits in a very tangible way, and the interest of labor is well evidenced by participation in case-finding surveys, by advocacy of health and hospital insurance coverage, by the appearance of health clauses in employment contracts. All the facts lead to the belief that interest will not fall off in any of these groups, but that industrial health programs will reach a stage of development commensurate with industry itself, and will constitute a major part of medicine and public health.

Community Health Organization

Haven Emerson, M.D.†

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AS communities differ in size, and in the qualities of the races, the wealth, the employments of the people that compose them, so the varied and complex activities in the interest of health assume many forms to match the need of the families and keep pace with the sciences and professions that serve them.

Organization, if at all appropriate, is determined by the functions an agency or institution is created to perform.

It will prevent confusion of thought and conflict of opinion and practice if we make clear our present meaning of health in a community sense. True it is, that the object of diagnosis and treatment of sickness or disability is to re-attain a status of health, a wholeness and fullness of being and enjoyment and vigor of life which is the very antithesis of dis-ease.

For this reason much popular discussion of health centers around the place of a variety of institutions and agencies which have as their primary if not their sole purpose the treatment of the sick as contrasted with the maintenance or improvement of health.

We speak rather loosely of the public health as if there were some condition or state of being which is public rather than private or personal in its manifestations.

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Let us agree that there are two major fields of service by persons trained in the medical and related sciences, that is physicians, dentists, nurses, sanitary engineers, veterinarians, nutritionists, health educators, laboratory workers, and other technical aids such as dental hygienists. These are care of the sick and prevention of disease. In the ordinary course of good general medical practice, as it has been developed in this country by the individual physician and for the patients and the families he serves in an intimate and peculiarly confidential relationship, both types of service are included, and very properly so. It is obviously the desire of the patient to know how he can avoid some preventable condition of ill-health with which he is threatened or which he fears may overcome him with advancing age or because of his occupation. It is a clear obligation upon the physician to follow up and supplement his advice and treatment in a matter of illness with warning, cautions and such information as will make the man, the mother or the school child better able to understand the principles of self-protection against disease by the means of personal hygiene, habits of moderation, sound use of body and mind and by avoidance of exposure to diseases of a communicable nature.

So-called curative and preventive medicine are part of the kind of service which private patients desire from their physicians and the latter expect to give.

This is a factor of first importance in the raising of the level of personal health, an understanding of what is really the elements of human biology among people of any community. This is not public health, except as public health is the sum and aggregate of the health of the individuals who make up a community.

However, the use of the medical sciences in modern society does not stop at the personal level but calls for a well recognized kind of organization of public agencies, institutions and services supported by tax money or voluntary contributions to carry on activities not practicable for the individual physician to supply.

From the point of view, then, of medical administration, i. e., the operation of institutions and agencies with a medical purpose, there are the two very large and distinct, although closely related, fields of organized, as distinct from individual, care of the sick and public health.

By organized care of the sick we mean the service activities of institutions such as hospitals and agencies such as visiting nursing for bedside care of the sick which express the combined energies and skills of many persons, professional, technical and lay, under a single corporate management for the offering of diagnosis and treatment of the sick. The end result in the particular case may be identical with that from the hands of an individual physician unaided by any facilities other than those he may possess or employ personally, but the increasing complexity and cost of equipment and its servicing for quick, accurate, complete diagnosis and the utmost skill and certainty of treatment require an investment of capital and employment of personnel with a great variety of skills and aptitudes which are impossible for the individual physician or patient to command.

The institutions and agencies for care of the sick sharing in the organized efforts of a modern urban community of a hundred thousand population or over in the United States of America today fall under the following eight categories if considered functionally:

1. Hospitals: general and special, tax supported, voluntary and proprietary, intended for the care of the horizontal sick persons who, because of the severity or other quality of their disease, require bed-care of a kind not practically obtainable in their homes.

2. Dispensaries, or out-patient services, often incorrectly called clinics, intended for the care of vertical patients, patients whose illness does not forbid their being up and about on their feet and not requiring lodging and boarding in an institution for the sick. A clinic properly defined is a diagnostic institution where the science and art of medicine is taught to doctors, nurses and others in undergraduate and graduate clinical courses, i. e., upon the patients who come and go through the institution. *γάλινη* is the bed or couch on which one lies, or we may say the examining table in universal use by physicians the world over; hence clinical, as distinct from laboratory diagnosis, the art of the clinician who studies and teaches upon the subject under his hands.

3. Ambulance service: or transportation of the sick between the home or place of attack or injury and the

hospital where diagnosis and treatment or either of these is to be offered. Wheels and wings by many means of propulsion by land, water and air tie every locus of man's existence ever more closely and more rapidly to the point where optimum medical skills are available.

4. Bedside care of the sick in the home by visiting nurses: to carry the skills of hospital ward and operating room to the home of patients for whom hospital care is not essential at the time and whose home conditions are compatible with good care in sickness, the patients in all instances being under the care of a physician to whom the nurse reports.

5. Medical Social Service: the indispensable professional assistance of persons trained and experienced in adjusting social and economic problems of the family in the patient's interest and so interpreting the home situation to the physician or hospital or dispensary and the medical plan of management of the patient and his disease to the patient and his family that the best result will be obtained for both patient and family. A hospital without medical social service as one of its professional departments is as unqualified to give excellent medical care as would be the case if there were no trained nurses to serve patients and physicians.

6. Convalescent hospitals: or homes to which the post-febrile or postoperative or postpartum patient may be sent for that period of rest and adjustment before returning to full occupation or self-support which calls, not for the costly care in a general hospital for the acutely ill, but for some occupation, recreation and rehabilitation, physically and mentally, where conditions resembling those of a pleasant home prevail without the obligations of the home-maker or wage-earner. About 20 per cent of general hospital patients are much benefited by two to three weeks of convalescent hospital care under medical guidance before they are discharged to their usual way of life.

7. Hospitals for the chronic sick: chronicity not being necessarily synonymous with permanent invalidism or incurable disease. The advancing average age of our population and the possibilities of mitigating and even of substantially relieving, if not actually curing, persons with certain chronic types of disease make it a humane obligation upon society to provide for such patients under conditions sufficiently different from those of a general hospital to call for a special hospital institution where the domiciliary and professional service conditions are appropriate to the illnesses of the patients and their ages which will be found spread over the whole span of life.

8. Home medical care: by physicians serving as externs out of good general hospitals, provided for such public charge patients in particular as have homes in which their illnesses can be properly cared for without necessitating their removal to a hospital bed. The diagnostic and treatment facilities and organization and responsibility of the hospital staff are thus available to the indigent sick without the additional cost of lodging and boarding the patient in a hospital, the family and the visiting nurse to be responsible for the necessary services at the bedside and in the home.

If the above facilities are provided a community will probably find that it has met the best standards for present-day care of the sick so far as this can be done with advantage by institutions and agencies supplementary to the care available through the private practitioner of medicine and the assistance he can command for the patients' benefit.

By public health services we mean and shall describe those activities carried on by local, state and federal civil government or with such governments' permission and legal consent, by tax-supported or voluntary agencies which apply the sciences and arts of preventive medicine for social ends, i. e., for the benefit of the community as a whole, rather than primarily for the individual.

Public health services, so defined, fall under six general functional headings, as follows:

1. Vital Statistics: the collection under some required form of notification, of records of births, deaths, and of certain reportable diseases of a communicable, occupational or nutritional character, and in some states of cancer, diabetes and heart diseases. This implies the tabulation, interpretation or analysis and publication of the results of such reported phenomena in a way to add to public information in an educational manner, and to increase knowledge of the natural history of vital phenomena and of the control or prevention of preventable diseases and deaths and of the tangible results of official and voluntary efforts to this end. The original data are to be obtained only through the authority of state statutes and local ordinances. The documents are official and confidential. This function is one of the earliest and most important of the functions of departments of health.

2. Control of communicable diseases: both those of childhood and youth, familiar in annual or irregular epidemic form, and those affecting all ages and occurring endemically and sporadically. In the latter category are in the United States chiefly tuberculosis, the venereal diseases, chiefly syphilis and gonorrhea, the dysenteries, malaria, and hook-worm disease.

This is the chief and traditional first of the functions of a local, state or federal health service according to its area of jurisdiction. By the success or failure in this field, official health performance has been largely judged, praised or blamed in the past, and this is still properly the case in large measure. Again the major responsibility for such control as is feasible rests upon local civil government and its official health agencies and upon the physicians of the community whose recognition of the reportable diseases and prompt notification is the first step in any system of control.

Voluntary agencies substantially supplement the official, by widespread public information and propaganda, also in the field of research and demonstration of new methods and resources, but they have no authority to enforce sanitary or public health law although their incorporation under non-profit membership corporation laws for educational and philanthropic purposes gives them a considerable prestige and influence, viz., the National Tuberculosis Association and its state and county

associations and the American Social Hygiene Association.

3. Environmental Sanitation: the control of those factors of our physical surroundings which, if neglected, would unfavorably affect our health, such as water supplies, the disposal of human and industrial wastes, the protection of milk, dairy and other perishable and processed foods, and public food preparation and serving, and the control of insects and vermin that are vectors or otherwise serve as direct or intermediate transmitters of communicable disease. In addition to this, environmental sanitation is concerned with the physical surrounding of all occupied persons, particularly in industries with hazards from dust, fumes, contact with poisonous metals, chemicals, etc. This is also a function only practicable for an official agency of civil government in cooperation with management and labor.

4. Public health laboratory service: for diagnostic and analytical aids in the control of disease, and environment, including milk and other foods, water, air, sewage, etc., an indispensable adjunct to the services under 2 and 3.

5. Supervision of the hygiene of maternity, infancy and childhood: including concern with eugenics, pre-marital and prenatal health, child-bearing, infancy, the pre-school and school-age child and minors in gainful occupations. This is in the main an educational and supervisory service and is a function widely undertaken not only by the medical, nursing, dental and other professions in their personal relations with patients but by a wide variety of public or official and voluntary or privately controlled agencies and particularly by departments of health.

6. Health education: the most recent of the functions of departments of health and voluntary health agencies, with wide scope and variety.

These six functions, and often others more or less appropriate and related, are served at four different levels of governmental jurisdiction, local, state or provincial, national, federal or dominion, and international or continental. Local government from the earliest times of our colonial and postrevolutionary history accepted or assumed responsibility for important health services, particularly in matters of general sanitation and abatement of nuisances, and for the purpose of controlling or avoiding epidemic disease. Such local departments of health are the backbone or foundation stones of all nation-wide health protection. About 95,000,000 of our people live in communities where there is a creditable amount and quality of local health service of an elementary kind.

Not until just before our Civil War were there any functioning State Departments of Health. Even now there are several states with but a vague and quite inadequate health organization at the state level. The functions of a state department of health are not primarily to supply services to the population of each local government of county, city, town or village, but to provide advisory, consultant and standardizing services and to raise the level of local personnel and performance and to provide financial and other assistance for such local communities as have insufficient resources to meet the cost

of a good quality of local health services. The state department of health also maintains certain central services not practicable for the county or town, such as a bureau of vital statistics, or laboratory, of health education and engineering.

The functions of the national or federal health agencies include the enforcement of interstate sanitary and commercial conditions related to health and to represent the federal government in international conventions. The federal health services have also consultant, advisory and regulatory functions of broad character with respect to use of grants in aid to the states to promote state and local health services. Research, education and demonstration are important functions of the federal health agencies.

All the three levels of health services above referred to are provided for at taxpayers expense and under specific legal authority.

International health organization began some years before World War I by a series of international sanitary conventions, signed by most of the nations, but with no mechanism except international opinion and the influence of commerce to obtain compliance.

The Health Section of the League of Nations provided consultations, advisory, educational, standardizing and epidemiological information services of a wide variety and great value to all countries. These services were gladly accepted, and their value was not in any power to enforce but in the authority with which the conclusions and advice of the League of Nations, in this respect, were arrived at.

It is probable that four levels of health organization will continue to have a useful purpose for the United States of America under any form of postwar international organization found practicable.

The problem of Community Organization is to assure the provision and collaboration of each of the described fourteen types of institutions, agencies and services to give optimum results for dollars spent, to prevent overlapping and duplication, and to make sure that the needs of the public are not forgotten in the rivalries, ambitions, and conflicting interests and resources of the participating organizations.

In the largest cities this is apt to be attempted through a single Council on Health and Hospitals or by creation of two centralizing councils, one on hospitals and kindred institutions for the sick and one on health, to include such agencies as are appropriate.

Excellent examples of such coordinating agencies are to be found in Boston, Cincinnati, Cleveland, Chicago, San Francisco, Detroit, Louisville, and New York, and in many other cities large and small where Councils of Social Agencies, Community Chests and other similar agencies have created a public opinion for coordination of related activities of local government and of citizen groups.

In smaller communities and in rural counties with populations scattered in townships, villages, boroughs, parishes and other local jurisdictions, the organization of health agencies and services for the sick usually falls upon a small and often informally associated group of public-spirited citizens, representative of what one may call the consuming public, the professions concerned and the administrative or executive officers of the public and private, official and voluntary agencies in the field.

Intelligent and effective community organization for any public non-commercial purpose demands a definition of the scope or field of interest, a knowledge of the extent of services rendered, their cost, the results or quality of such services, the needs appreciated for more or other kinds of services of a similar or cognate character, and the persons in the community who can be relied upon to observe objectively and study impersonally the problems which concern the public rather than those inherent in the operation of any particular institution or agency.

The public's concern with the quality and availability of institutional services for the sick and its dependence for survival upon the performance of the basic public health functions are so professionally and financially interrelated that, except in cities of the largest size, it will probably be best to have, in most communities, a single coordinating Council on Health and Care of the Sick, with appropriate sections or divisions devoted to important subfunctions.

There should be represented upon such a council the following groups of interested parties in the community: the professions of medicine, including the health officer, dentistry, nursing and social work; the trustees or executive officers of the institutions and agencies within the interest of the council; the clergy; the press; the local chamber of commerce; the local government, ex-officio; labor; and the public educational authorities. It is expected that men and women of influence and experience in public affairs would be drafted for such council service as representatives of the public at large.

Even the small town and rural county can make strides in the organization of its health and hospital services through a committee of not more than five persons, including the health officer, the leading physician or surgeon, an officer of local government, councilman, or county commissioner, or mayor, a representative of the visiting nurses, if there is such a voluntary organization, and the superintendent of the local hospital, be it man or woman.

Community Health Organization is essentially an expression of the spirit and conscience of the people of a neighborhood or jurisdiction of local government, concerned with obtaining the most effective and humane use of contemporary knowledge of the medical sciences and of human biology at the least expense consistent with good quality of care of the sick and protection and promotion of the public health.

Seventy-five Years of Medical Journalism in the Northwest.[†]

Harold S. Diehl, M.D.[†]

Minneapolis, Minnesota

CONGRATULATIONS to the JOURNAL-LANCET on its seventy-fifth birthday.

In 1869, Dr. Alexander J. Stone, "a young, ambitious man," arrived here from New England. "There was no medical journal published west or north of Milwaukee." "I found," he said, "in conversation with the older men, that there was a probable field for one and began the *Northwestern Medical and Surgical Journal* in the spring of 1870."

Three quarters of a century is a long period for uninterrupted medical journalism. Only a few American medical journals have a longer record of continuous publication.

This is a notable record, but of even greater significance is the progress in medical science which has been recorded in its pages. Truly the past seventy-five years has been the golden era of medical progress. In July 1870 when the first issue of the *Northwestern Medical and Surgical Journal* was published—the name was changed to *Northwestern Lancet* in 1881 and to *the JOURNAL-LANCET* in 1911—the work of Pasteur and Koch, showing the relation of bacteria to disease, was still unfinished. Smallpox vaccination involved the use of the "scab" from one person for the vaccination of others. In fact, one of the "Medical Notes" in the first issue of this Journal contains the following suggestion for "Preserving Vaccine Virus":

"Take a portion of common alum and place it upon a red hot stove until the water of crystallization is driven off. Of this dried alum fill half full a bottle of an ounce capacity. Envelope the vaccine scab in a piece of paper and tin-foil and place it over the alum in the vial. Adapt a well fitting cork, and cut off even with the top of the bottle. Seal air tight with sealingwax."

Unknown at that time were the infectious agents of communicable diseases, asepsis in surgery, antitoxins for diphtheria and tetanus, vaccines for typhoid, diphtheria, etc., pasteurization of milk, chlorination of drinking water, insulin for diabetes, liver for anemia; insect transmission of malaria, yellow fever, typhus, etc., salvarsan and mercury for syphilis, while the sulfonamides and penicillin were unheard of until more than half a century later.

Treatment was complicated and empirical. Drugs in unbelievable numbers were prescribed in complicated and exacting combinations. Therapeutic notes and suggestions in the first issue of this Journal contain prescriptions for "sulphate of zinc in sugar of lead" for gonorrhea; "sulphurous acid for syphilitic ulceration of the throat"; "potassium chloride as a substitute for potassium bromide in epilepsy"; "chlorate of potash and opium in threatened abortion"; the use of electricity in obstetrics; "the white of an egg as a remedy for burns; and a suggestion from the "Ed" to "Try chloral hydrate in peritonitis."

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Of special interest to me is the first paper in this first issue. Its title is "Chronic Catarrh"; its author, D. W. Hand, M.D., of St. Paul, Minnesota.

"Catarrh, or more definitely, post-nasal catarrh," he writes, "is the most common affection of this climate. It prevails extensively in this as well as all other Northern States, and the public mind having of late been much called to it, we constantly hear the remark that it is so much more frequent now than in years past.

"It affects all ages, and when once established, is annoying during all seasons.

"The cause can readily be found in the sudden and extreme changes of temperature to which we are subjected in winter, and the general introduction of coal and air tight stoves is the reason why the disease is so much more common than it was thirty or forty years ago. To pass from a room, heated by a furnace to a temperature of 70 degrees, into the open air at zero, or below; or to step from a close, highly heated railroad car upon an exposed platform, where the cold piercing wind chills you through, must do injury to the delicate mucous membrane of the nose and throat.

"As developed, that injury, in the majority of cases, becomes catarrh. Often we have at once all the symptoms of an active inflammation, viz.: a chilly sensation, followed by fever, aching of the limbs and back; pain over the eyes; a sense of stuffing in the ears, and dryness in the nose and throat. After twenty-four or more hours, there is generally a free effusion of serum; the nose runs freely, and the extremity of suffering is relieved. Often, however, before this takes place, there has been an extension of the inflammation along the Eustachian tubes to the internal ear, and violent catarrh is set up there. This frequently ends in suppuration, and rupture of the membrana tympani

In certain chronic cases "The thickened granular condition of the mucous membrane obstructs the Eustachian tubes, and causes deafness, with annoying noises in the ears; the eyes become red and weak, the memory fails, and the patient is often reduced to a pitiable condition

"Treatment. Should a case of catarrh be seen in the forming stage, it is possible to cut it short by rest, warmth, and the proper use of opium. The patient must remain quiet in a warm room, use a hot foot-bath, and at bed-time take a teaspoonful of paregoric, a quarter of a grain of morphia, or ten grains of Dovers powder. It is worse than useless to use any kind of snuff or wash in this stage. In twenty-four hours he will usually be free from his catarrh, but with such remaining sensibility that exposure may readily start another. He should therefore remain comparatively quiet for a few days longer."

The recommended use of opium for the treatment of acute coryza is of special interest because our own carefully controlled studies, conducted more than sixty years later, demonstrated that: "Of the drugs studied, only opium and certain alkaloids derived from it seem to be of value in the treatment of acute coryza."[‡]

The rest of the article recommends the treatment of chronic catarrh by a vigorous and continuous regime of nasal irrigations, antiseptic washes, gargles and inhalations for which more than a dozen prescriptions are suggested. This treatment is to be continued until the con-

[‡]Diehl, H. S.: "Medicinal Treatment of the Common Cold." J.A.M.A. 101:2042, December 23, 1933.

dition is completely cured—a result which could hardly occur while such irritation of the nasal mucous membranes was continued.

The second issue of this Journal reports an interesting debate at the meeting of the Minnesota State Medical Association on a resolution: "That an invitation be extended to Mrs. Preston, M.D., to participate in the deliberations of the Society during its sessions."

Dr. Mayo and others recommended that she be admitted to membership in the Association. The opposition insisted that this involved "a larger question, whether the regular school shall recognize female practitioners." Objections were based upon "physiological disabilities" and upon "respect for female delicacy" which would prevent the discussion of certain medical subjects if women were present.

The final statement and action was: "This female-woman question is looming up, and you cannot stop it. But as regards this particular case, I shall move that the resolution be tabled. If Mrs. P— comes with her credentials, she will of course be referred to the committee on credentials. Motion seconded and carried."

Seventy-five years ago the University of Minnesota had just enrolled its first class of collegiate students, eighteen in number. A number of medical schools existed throughout the country but almost without exception these were proprietary schools conducted by a group of practitioners, less than half a dozen being integral parts of universities. The St. Paul School for Medical Instruction had just been established. "We heard recita-

tions, in our offices, for two years. We were then able to secure the upper portion of the morgue of St. Joseph's Hospital, and we taught there for three years more; we then rented the upper two stories of a building on Third Street . . . In two years more, we formed the St. Paul Medical College, which was universally recognized, at the time, by the other colleges and the medical men throughout the United States, as the first college to require a four years' course."§

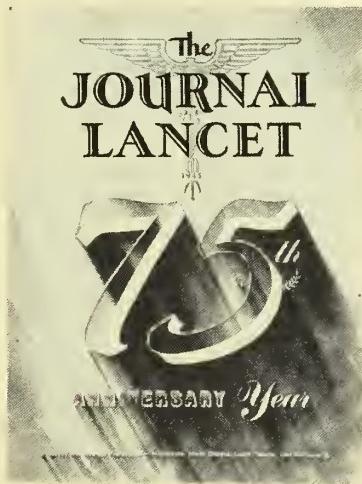
During this period or shortly thereafter four other medical schools were established in the Twin Cities and one in Winona. The inadequacy of these schools was recognized by the physicians who founded them but they represented an attempt to meet the need for trained physicians in a new, sparsely populated, frontier state.

Eighteen years later three of the four medical schools gave their charters and facilities to the Regents of the University in order that there might be established in Minnesota a single, strong University Medical School. The other medical school, which had become the medical department of Hamline University, merged with this University School in 1908. Subsequent developments have demonstrated the foresight and wisdom of these actions.

Truly these have been golden years of progress in medicine, medical education, and public health. The JOURNAL-LANCET merits the appreciation of the medical profession for having served it well during this era.

§Stone, Alexander J.: "The St. Paul Medical College," The Unification of Medical Teaching in the State of Minnesota, December 8, 1908, University of Minnesota.

FRONT COVER



COVER DESIGN of this anniversary issue of JOURNAL-LANCET is by Hec Mann, a New Zealander now practicing in Minneapolis his ingenuity in the graphic arts. It is symbolically mindful that in 75 years medical publishing has cast much light on the development of medicine and that the progress of the profession is reflected in the continuity of service rendered by this publication.

Official Journal of the
American Student Health Association
Great Northern Railway Surgeons' Association
Minneapolis Academy of Medicine
Montana State Medical Association
North Dakota Society of Obstetrics and Gynecology
North Dakota State Medical Association
Northwestern Pediatric Society
Sioux Valley Medical Association
South Dakota Public Health Association
South Dakota State Medical Association

• EDITORIALS •

DISEASE AND MORALS

As Dr. Diehl has pointed out, the changes in medical thinking that have taken place during the JOURNAL-LANCET's lifetime have been little short of revolutionary. Almost as significant have been the changes in our conception of morals. Disease and sin had been closely correlated for thousands of years—ever since witch doctors exorcised demons from tabu breakers. If medical science in the 19th century reduced this ancient superstition to a vestigial remnant, it must be remembered that Mary Baker Eddy and the JOURNAL-LANCET grew up practically side by side and that many a cult flourished to attest that the old superstition was far from dead. Nevertheless germs drove out devils, guinea pigs replaced the swine of the Bible, and today of the seven deadly sins only gluttony and sloth are fairly blamed as direct causes of man's infirmities—and even these may be freed from responsibility when we know more of endocrine glands.

But while reformers were gradually forced to abandon the idea that cigarette-smoking led inevitably to mental deterioration, a glass of beer or wine to a pickled liver, there remained the diseases of sex and alcohol whose relation to sin was so obvious that even medical science scarcely dared defend the sufferers above a whisper. Until World War 1 when the campaign against venereal diseases really got under way, the average "nice" person was convinced that these diseases were the just punishment of unbridled passions. This attitude and the rather nasty hush-hush treatment of sex generally delayed both adequate care of the infected and adequate prevention of infection's spread. And as for the poor alcoholic, if exhortations failed to mend his ways, he was left to the "Keeley cure," the Salvation Army, or the workhouse.

But within recent years these two last strongholds of medical Puritanism have been attacked. Two booklets have been received at this office recently that make cheering reading. One is from the Research Council on the Problem of Alcohol (60 E. 42nd St., New York 17), the other from the American Social Hygiene Association (1790 Broadway, New York 19). Both prove that thinking persons refuse longer to confuse medical problems with moral issues.

The Research Council is only five years old. It is supported by all manner of people except those primarily interested in prohibition—by scientists, business men, distillers, etc. Its purpose is to conduct an unbiased study of the relation of alcohol to the health of the individual, and in so far as possible bring definite help to the alcoholic. It plans to run a clinic in New York in conjunction with one of the universities as soon as funds are available. Its Report No. 7 by E. H. L. Corwin and Elizabeth V. Cunningham is an 85-page study of the

Institutional Facilities for the Treatment of Alcoholism and it discloses an appalling lack of such facilities. It is a carefully written pamphlet and a most interesting one.

The other booklet is one published by the American Social Hygiene Association in cooperation with the U. S. Public Health Service. It is a Summary of State Legislation Requiring Premarital and Prenatal Examinations for Venereal Disease. The first state to pass such legislation was Connecticut in 1935. In the short period of eight years 29 other states have followed with similar laws. (South Dakota is the only one of our group to have joined the vanguard). Here is information regarding the laws in the 30 states, how they agree and how they differ, provisions for tests, fees, etc., legal references—information that should be invaluable for groups or individuals interested in advancing similar legislation.

Both of these booklets may be had for the asking. Both prove that one thing that happened while the JOURNAL-LANCET was growing up was that we, the people, were gaining a little in wisdom and common sense.

M. U.

THE MAYO MEMORIAL

Seventy-five years ago the name of Mayo was just beginning to appear on the horizon of medicine in Minnesota. Dr. William Worrall Mayo, "a man of hope and forward looking vision," had established himself in practice in the small frontier town of Rochester. His two boys, William J. and Charles H., were nine and five years old.

Today, seventy-five years later, a memorial is being planned to these world famous surgeons who have brought credit and distinction to their country, their state, and to their profession. This memorial is being planned by a committee of founders, authorized by the legislature and appointed by the Governor of Minnesota. This committee, under the chairmanship of Dr. Donald J. Cowling, after careful consideration decided that the most appropriate memorial would be a new center for medical education and medical research at the University of Minnesota, the institution in which the Doctors Mayo were deeply interested and to which they contributed so much throughout their lifetimes.

The Committee of Founders deserves commendation for their wise choice of a memorial which not only will honor these two great American physicians but also will provide facilities that will inaugurate a new era of development for medicine in this area. This is a project which merits the wholehearted support of both physicians and laymen.

H. S. D.

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**LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
NOVEMBER 10, 1944**

SPECIAL AUGUST EXAMINATION (Aug. 29, 30, 31, 1944)

Name	School	Address
Ahrens, Curtis Frank	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Amatuzio, Donald Stanley	U. of Minn. M.B. 1944	120 N. 57th Ave. W., Duluth, Minn.
Anderson, Chester Albert	U. of Minn. M.B. 1944	2008 Grand Ave., St. Paul 5, Minn.
Anderson, Werner Willard	U. of Minn. M.B. 1944	1115 Pine St. S. E., Brainerd, Minn.
Barron, Sholom Steven	U. of Minn. M.B. 1944	1733 Pinehurst Ave., St. Paul 5, Minn.
Benson, Ellis Starbranch	U. of Minn. M.B. 1944	Cincinnati General Hospital, Cincinnati, Ohio
Bernstein, William G.	U. of Minn. M.B. 1944	Fresno County Hospital, Fresno, Calif.
Bourget, Gerald Edward	U. of Minn. M.B. 1944	Western Pennsylvania Hospital, Pittsburgh, Pa.
Boynton, Bruce	U. of Minn. M.B. 1944	St. Mary's Hospital, Duluth, Minn.
Brotchner, Leonard Alexander	U. of Minn. M.B. 1944	Cedars of Lebanon Hospital, Los Angeles, Calif.
Burke, Edmund Charles	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Burmeister, Richard Otto	U. of Minn. M.B. 1944	Ellis Hospital, Schenectady, N. Y.
Burns, Craig Alden	U. of Minn. M.B. 1944	Presbyterian Hospital, Denver, Colo.
Chalgren, William Schlutz	U. of Minn. M.B. 1943, M.D. 1943	2024 Commonwealth Ave., St. Paul, Minn.
Christoferson, Lee Allen	U. of Minn. M.B. 1944	Cleveland Clinic Foundation Hosp., Cleveland, Ohio
Coe, John Ira	U. of Minn. M.B. 1944	916 Delaware St. S. E., Minneapolis, Minn.
Cole, Richard Lemuel	U. of Minn. M.B. 1944	Youngstown Hospital Assoc., Youngstown, Ohio
Daly, David de Rouen	U. of Minn. M.B. 1944	1959 Summit Ave., St. Paul 5, Minn.
Darling, Alice Louise	U. of Minn. M.B. 1944	Marshall, Minn.
Dowell, Margaret	U. of Minn. M.B. 1944	Research & Educational Hospital, Chicago, Ill.
Eder, Walter Phillip	U. of Minn. M.B. 1944	3006 W. 44th St., Minneapolis 10, Minn.
Erickson, Laurence Fredrick	U. of Minn. M.B. 1944	4915 Tenth Ave. S., Minneapolis, Minn.
Evert, Robert Nash	U. of Minn. M.B. 1944	Mercy Hospital, Pittsburgh, Pa.
Gehrig, Leo Joseph	U. of Minn. M.B. 1944	Salt Lake County Gen. Hosp., Salt Lake City, Utah
Giebenhain, John Nicholas	U. of Minn. M.B. 1944	Miller Hospital, St. Paul, Minn.
Gillam, John Sloane	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Goltz, Neill Francis	U. of Minn. M.B. 1943	2259 Summit Ave., St. Paul 5, Minn.
Hall, Thomas Newton	U. of Minn. M.B. 1944	729 Second Ave. W., Grand Rapids, Minn.
Hanson, Mark C. L.	U. of Minn. M.B. 1944	Boston City Hospital, Boston, Mass.
Hartman, Seymour Arnold	U. of Minn. M.B. 1944	Queens General Hospital, Jamaica, L. I., New York
Hass, Frederick Merton	U. of Minn. M.B. 1944	Miller Hospital, St. Paul, Minn.
Haugen, George William	U. of Minn. M.B. 1944	510 Mill St. S., Fergus Falls, Minn.
Hauser, Elizabeth Burch	U. of Minn. M.B. 1944	Rochester General Hospital, Rochester, N. Y.
Hitchcock, Claude Raymond	U. of Minn. M.B. 1944	3655 47th Ave. S., Minneapolis, Minn.
Holly, Roy Groves	U. of Minn. M.B. 1943	518 S. Main St., Waupaca, Wis.
Howard, Robert Bruce	U. of Minn. M.B. 1944	University Hospitals, Minneapolis 14, Minn.
Jenson, James Edward	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Johnson, Richard John	U. of Minn. M.B. 1944	Ancker Hospital, St. Paul 1, Minn.
Karlson, Karl Eugene	U. of Minn. M.B. 1944	University Hospitals, Minneapolis 15, Minn.
Kinkade, Byron R.	U. of Minn. M.B. 1944	Baltimore City Hospitals, Baltimore, Md.
Koskela, Albert Leo	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Kremen, Isadore C.	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Krezowski, Thomas Kajetan	U. of Minn. M.B. 1944	Milwaukee County Hospital, Milwaukee, Wis.
Kusske, Bradley Walter	U. of Minn. M.B. 1944	St. Joseph's Hospital, St. Paul 2, Minn.
Larson, Paul Giere	U. of Minn. M.B. 1944	Sacramento County Hospital, Sacramento, Calif.
Lawrason, Fredrick Douglas	U. of Minn. M.B. 1944	New Haven Hospital, New Haven, Conn.
LeBien, Wayne Ernest	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Lee, Norman James	U. of Minn. M.B. 1944	Ancker Hospital, St. Paul 1, Minn.
Lindblom, William Howard	U. of Minn. M.B. 1944	Indianapolis City Hospital, Indianapolis, Ind.
Lindell, Robert Erwin	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Lindsay, Douglas Twichell	U. of Minn. M.B. 1944	University Hospitals, Minneapolis 14, Minn.
Martin, George Riley	U. of Minn. M.B. 1944	San Bern. Co. Charity Hosp., San Bernardino, Calif.
McGrew, Elizabeth Anne	U. of Minn. M.B. 1944	Milwaukee County Hospital, Milwaukee, Wis.
Merrick, Robert Lynn	U. of Minn. M.B. 1944	1500 Chicago Ave., Minneapolis, Minn.
Miller, Arden Laverne	U. of Minn. M.B. 1944	St. Joseph's Hospital, St. Paul 2, Minn.
Moren, J. Adelaide	U. of Minn. M.B. 1944	Children's Hospital, San Francisco 14, Calif.
Nadeau, Gerald Hubert	U. of Minn. M.B. 1944	Peoples Hospital, Akron, Ohio
Nelson, Paul Roger	U. of Minn. M.B. 1943	Cleveland City Hospital, Cleveland, Ohio
Nordland, Martin Albert	U. of Minn. M.B. 1944	Northwestern Hospital, Minneapolis 7, Minn.
Norley, Theodore	Hahnemann, Pa., M.D. 1943	Mayo Clinic, Rochester, Minn.
O'Phelan, Edward Harvey	U. of Minn. M.B. 1944	Fordham Hospital, New York, N. Y.
Pallister, Philip David	U. of Minn. M.B. 1944	Children's Hospital Society, Los Angeles, Calif.
Pearson, Roy Thorwald	U. of Minn. M.B. 1944	c/o B. F. Pearson, M.D., Shakopee, Minn.
Peltier, Leonard Francis	U. of Minn. M.B. 1944	University Hospitals, Minneapolis 14, Minn.
Perry, John William	U. of Minn. M.B. 1944	Hospital of the Good Samaritan, Los Angeles, Calif.
Petersen, Donald Harry	U. of Minn. M.B. 1944	West Suburban Hospital, Oak Park, Ill.
Peterson, Kenneth Harold	U. of Minn. M.B. 1944	Bethesda Hospital, St. Paul 1, Minn.
Plattes, Gordon John	U. of Minn. M.B. 1944	Harper Hospital, Detroit 1, Mich.
Riegel, Fred B.	U. of Minn. M.B. 1944	Henry Ford Hospital, Detroit, Mich.
Robertson, James Sydnor	U. of Minn. M.B. 1944	800 Freeborn St., Austin, Minn.
Rukavina, John George	U. of Minn. M.B. 1944	St. Mary's Hospital, Duluth, Minn.
Rusterholz, Alan Paul	U. of Minn. M.B. 1944	West Suburban Hospital, Oak Park, Ill.

Sather, Edgar Leland	U. of Minn. M.B. 1944	Harper Hospital, Detroit, Mich.
Schaefer, Joseph Alexander	U. of Minn. M.B. 1944	Detroit Receiving Hospital, Detroit, Mich.
Schmidt, Richard Henry	U. of Minn. M.B. 1944	Milwaukee County Hospital, Milwaukee, Wis.
Schroeder, Albert John	U. of Minn. M.B. 1944	21 Malcolm Ave. S. E., Minneapolis, Minn.
Schultz, Donald Oscar	U. of Minn. M.B. 1944	Fordham City Hospital, New York, N. Y.
Schumacher, John Wesley	U. of Minn. M.B. 1944	Broadlawns Polk County Hosp., Des Moines, Iowa
Segal, Martin A.	U. of Minn. M.B. 1944	Lincoln Hospital, New York, N. Y.
Seifert, Paul John, Jr.	U. of Minn. M.B. 1944	Sacred Heart Hospital, Spokane, Wash.
Simon, Daniel	U. of Minn. M.B. 1944	618 5th Ave. S., Virginia, Minn.
Soboloff, Hyman Robert	U. of Minn. M.B. 1944	St. Catherine's Hospital, East Chicago, Ind.
Solhaug, Samuel Bernard, Jr.	U. of Minn. M.B. 1944	Northwestern Hospital, Minneapolis 7, Minn.
Stensgaard, Kermit Luther	U. of Minn. M.B. 1944	Detroit Receiving Hospital, Detroit, Mich.
Stone, Harvey William	U. of Minn. M.B. 1944	University Hospitals, Minneapolis 14, Minn.
Strobel, Robert John	U. of Minn. M.B. 1944	Johns Hopkins Hospitals, Baltimore, Maryland
Swisher, Scott Neil, Jr.	U. of Minn. M.B. 1944	Strong Mem. Hospital, Rochester, N. Y.
Taylor, Donald Eugene	U. of Minn. M.B. 1944	599 S. Warwick St., St. Paul 5, Minn.
Taylor, Gloria Anne	U. of Minn. M.B. 1944	599 S. Warwick St., St. Paul 5, Minn.
Torreens, John Klopp	U. of Minn. M.B. 1944	West Suburban Hospital, Oak Park, Chicago, Ill.
Uhrich, Edward Claude	Temple U. M.D. 1943	Mayo Clinic, Rochester, Minn.
von Amerongen, Frederick Karl	U. of Minn. M.B. 1944	St. Vincent's Hosp., 2131 W. 3rd St., Los Angeles 5, Calif.
Wallin, Ira O.	U. of Minn. M.B. 1944	Fresno County General Hospital, Fresno, Calif.
Walter, Frederick Harold	U. of Minn. M.B. 1944	St. Luke's Hospital, Duluth, Minn.
Webber, Richard John	U. of Minn. M.B. 1941, M.D. 1942	Naval Train. School, U. of Minn., Mpls. 14, Minn.
Westover, Darrell Eugene	U. of Minn. M.B. 1944	Mpls. General Hospital, Minneapolis 15, Minn.
Wilson, Franklin Charles	U. of Minn. M.B. 1944	Sacred Heart Hospital, Spokane, Wash.
Wohlrabe, A. Cabot	U. of Minn. M.B. 1944	Hospital of the Good Samaritan, Los Angeles, Calif.
Wolgamot, John Roland	U. of Minn. M.B. 1944	Norfolk General Hospital, Norfolk, Va.
Wylie, Robert Leonard	U. of Minn. M.B. 1944	California Hospital, Los Angeles, Calif.

BY RECIPROCITY

Friend, Arthur William	Queen's Univ. M.D. 1929	Campus Club, U. of Minn., Minneapolis 14, Minn.
McLaughlin, Byron H.	U. of Pittsburgh, M.D. 1943	3210 Girard Ave. S., Minneapolis 8, Minn.
Paalman, Russell John	U. of Mich. M.D. 1938	Mayo Clinic, Rochester, Minn.
Wells, Marvin	U. of Wis. M.D. 1942	1009 Nicollet Ave., Minneapolis 2, Minn.

(Storaasli, Paul Gerhard, Luverne, Minnesota. U. of Minn. M.B. Aug. 24, 1944. Successful candidate for medical licensure—special examination, Aug. 29, 30, 31, 1944. Killed Sept. 28, 1944, in crash of Chicago and North Western Line passenger train near Missouri Valley, Iowa.)

OCTOBER EXAMINATION

Name	School	Address
Aldrich, Charles Anderson	Northwestern, M.D. 1915	Mayo Clinic, Rochester, Minn.
Baker, Howard Allen	Wayne U. M.D. 1943	Grace Hospital, Detroit, Mich.
Bolz, John Arnold	U. of Chicago M.D. 1943	Crane Lake, Minn.
Brenner, Hymie Henry	U. of Wis. M.D. 1943	Mpls. General Hospital, Minneapolis 15, Minn.
Browning, William Hayner	U. of Kans. M.D. 1943	Mayo Clinic, Rochester, Minn.
Canfield, Albert	U. of Minn. M.B. 1942, M.D. 1943	Mpls. General Hospital, Minneapolis 15, Minn.
Costin, Maurice Edward	Harvard U. M.D. 1942	Mayo Clinic, Rochester, Minn.
Cox, Walter Bedford	U. of Chicago M.D. 1943	Mayo Clinic, Rochester, Minn.
Dille, Rodger Swain	Northwestern U. M.B. '38, M.D. '39	Mayo Clinic, Rochester, Minn.
Fletcher, Mary Elisabeth Herberich	Syracuse U. M.D. 1941	Mayo Clinic, Rochester, Minn.
Fryfogle, James D.	Wayne U. M.D. 1943	Mayo Clinic, Rochester, Minn.
Gibson, Robert Hale	U. of Oregon M.D. 1943	Mayo Clinic, Rochester, Minn.
Hays, John Collins	U. of Minn. M.B. 1943	Mpls. General Hospital, Minneapolis 15, Minn.
Holmes, Carl A.	Northwestern U. M.B. '43, M.D. '44	Mayo Clinic, Rochester, Minn.
Horan, Michael Joseph, Jr.	N. Y. Med. Col. M.D. 1942	Mayo Clinic, Rochester, Minn.
Martens, Theodore Glenn	U. of Rochester M.D. 1943	Mayo Clinic, Rochester, Minn.
Maynard, Mason Sherwood	U. of Mich. M.D. 1941	Mayo Clinic, Rochester, Minn.
Myers, Thomas Twidwell	Rush Med. Col. M.D. 1935	Mayo Clinic, Rochester, Minn.
Neibling, Harold Alden	Northwestern U. M.B. '43, M.D. '44	Mayo Clinic, Rochester, Minn.
Nickell, David Francis	U. of Louisville M.D. 1941	Mayo Clinic, Rochester, Minn.
Norval, Mildred Ardell	U. of Illinois M.D. 1941	Mayo Clinic, Rochester, Minn.
Pugh, Philip France Howard	Temple U. M.D. 1943	Mayo Clinic, Rochester, Minn.
Vigran, Irwin Myron	U. of Cincinnati M.D. 1943	Mayo Clinic, Rochester, Minn.
Wehner, Merle Ernest	Col. of Med. Evang. M.D. 1944	318½ W. Saginaw, Lansing, Mich.
Weir, James Robert	U. of Illinois M.D. 1943	240 Emerald St. S. E., Minneapolis 5, Minn.
Zaslow, Jerry	Temple U. M.D. 1940	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Crabtree, James Curtis, Jr.	Tulane U. M.D. 1943	N.P.B.A. Hosp., 1515 Charles St., St. Paul 4, Minn.
Frank, Walter Leslie, Jr.	St. Louis U. M.D. 1941	3603 Aldrich Ave. S., Minneapolis 12, Minn.
McCarthy, Harry Huntley	Creighton U. M.D. 1937	Mayo Clinic, Rochester, Minn.
Moody, Frank Sims	Harvard U. M.D. 1940	.707 Thorpe Bldg., 523 Marquette, Mpls. 2, Minn.
Schwarze, Cyril Arthur	U. of Wis. M.D. 1938	Gopher Ordnance Works, Rosemount, Minn.
NATIONAL BOARD CREDENTIALS		
Billeter, Oscar Arnold	U. of Chicago M.D. 1939	950 Med. Arts Bldg., Minneapolis 2, Minn.
Farber, Eugene Mark	U. of Buffalo M.D. 1943	Mayo Clinic, Rochester, Minn.
Watia, Vieno Tuulikki	U. of Mich. M.D. 1933	508 Quincy St., Hancock, Mich.

Book Reviews

Rebel Without A Cause, the Hypnoanalysis of a Criminal Psychopath, by ROBERT M. LINDNER, Ph.D., U. S. Public Health Service (R), Psychologist U. S. Penitentiary, Lewisburg, Pa. Grune & Stratton, N. Y., 1944. 296 pages including index, price \$4.00.

Dr. Lindner is a pioneer in a brand new field. By a technique that combines psychoanalysis and hypnotism he undertakes to probe into the drives and conflicts that underlie criminal "psychopathic personalities," and he offers the first hope of an intelligent understanding of these baffling cases who make up from 15 to 20 per cent of our penal institutions. Psychopathy is alarmingly on the increase in the world in general. The "mononuclear psychopathic center has communicated its convulsive impulses outwardly to awaken latent psychopathy" and hence it is supremely important that we learn to recognize these cases for the protection of the world in general. "The essence of the problem is that it represents a social and even a political problem of the first magnitude."

Dr. Lindner's premise is that we must first of all understand the forces that produce the antisocial, predatory behavior. For his purpose he chose a young penitentiary inmate whom he calls Harold. We are given the case history, learn of his beginnings, his decent family, their manner of living and Harold's past record. Then follow the "interviews." There are 46 of them, all recorded verbatim by means of a concealed microphone connected with a loud speaker in another room. Harold is a near-murderer, a drug addict, a sex pervert, etc. During each interview he was first led to talk by the usual psychanalytic technique and when the resistance became too great he was placed in a state of hypnosis during which he was able to describe occurrences that frightened or thwarted him back to his early infancy. By the last interview he has recorded all the significant events of his entire history and has accepted the diagnosis.

As to the curative values of his technique, Dr. Lindner makes no sensational claims. He does claim, however, that in Harold's case, as in those of a series of six he carried through, there was brought about "an essential personality change which is the outcome of the redistribution of psychological energy formerly exploited by the pathological condition." He believes, too, that for purposes of diagnosis his technique would be of advantage in the armed services, requiring, as it does, less time than psychoanalysis alone and going deeper. And for the criminal psychopath we must agree with the Doctors Glueck of Harvard who write the introduction, that "any process of diagnosing and treating offenders that is more promising than the almost bankrupt procedures now employed by society is to be given full encouragement."

There is no denying that praiseworthy as is this treatise, it makes grim reading. It contains necessarily much repetitious matter as Harold returns again and again in the different interviews to his fear and hatred of his father, his sexual frustrations with girls, his homosexual leanings. Harold is pathetic, of course, but he is about as unpleasant a character as you would care to meet, the more that he has a certain degree of intelligence and suggests again and again the infamous S. S. troops of Hitler. But to the criminologist, educator, judge, sociologist and psychiatrist Harold should have the fascination that a rare cancer has for the pathologist.

Mankind So Far, by WILLIAM HOWELLS; The American Museum of Natural History Science Series; Doubleday, Doran & Co., New York, 319 pages including index, price \$4.50.

For most doctors "outside" reading has become one of the many joys they have felt obliged to postpone until the day when peace ushers us into the promised brave new world. This is a pity for now more than ever before we need to escape from

our daily world of men and women too often constipated in body and mind, into the world of free-flowing ideas.

The war books we read as we read newspapers. Their stories excite and thrill us, but they are hot with the immediacy of the moment and report for the most part the doings of a world that seems fanatically determined on suicide. But now and again comes a book that does to our tired minds what a good nap does to our tired bodies; a three-dimensional book whose wisdom and wit throw open a door on a new and refreshing vista. This then is the reviewer's apology for introducing into these august columns a book that has nothing whatever to do with medicine.

Mankind So Far is an "escape" book in the best sense of the word. It is the dramatic story of man's advance through a million or so years from the time he was about to drop his tail, take to the ground and begin to walk on two legs until he emerged in all his glory as homo sapiens. The story is told by a noted anthropologist with so much engaging charm and humor that even if many of the facts are vaguely familiar to you you will feel that you never really had known them before. Rarely has a scientist written with such gaiety and freshness. This is primarily of course because most scientists are conceived solemnly and retain their solemnity throughout life. But for Dr. Howells the unfolding drama of life has its comic no less than solemn side and he simply cannot take homo sapiens too seriously. Part of the book's charm is due also I think to the exhilaration of seeing millions of years tossed around as blithely as in his heyday Harry Hopkins tossed about millions of dollars.

The accounts of the first discoveries of bits of skull, teeth and jaw-bones, dug from caves and sand-pits where they had lain quietly sleeping for more than a million years, the reconstructing of the man and his culture from a few such scraps, the controversies that waged about them, make as exciting reading as a detective story. The anthropoid apes take on a new dignity and the section on the nature of origin of races would make Hitler chew up another carpet. When in the last chapter Dr. Howells attempts a little crystal-gazing—he heads his chapter "1492 to 1,000,000, A.D."—he proceeds cautiously and bases his predictions on current trends, but he retains his cheerful optimism to the end.

Even the war retired from consciousness while this reviewer read far into the night. So we recommend it to all doctors as an "escape" book, par excellence.

Urological Surgery, by AUSTIN I. DODSON, M.D., F.A.C.S., Professor of Urology, Medical College of Virginia, Richmond. With seven associated contributors. 768 pages, 576 illustrations. St. Louis: The C. V. Mosby Co., 1944. Cloth. \$10.00.

This well-balanced presentation of practical surgery of the genito-urinary system has been assembled from the vast surgical and teaching experience of one of the country's outstanding urologists. The greater portion of the book is devoted to detailed descriptions of the operations performed in the domain of urology. The remainder of the book discusses the problems of urological surgery, and there is emphasis on the variations from surgery in general.

The sections on pre- and postoperative care and the chapters discussing fluid administration, acid-base balance, and anesthesia are particularly distinctive and of value.

The style of the various writers is smooth, concise, and provides easy reading. The text is well-illustrated and excellent types of all procedures are discussed. There is a thorough subject and author index, and chapter bibliographies provide further supplementary references.

The standardized operative procedures in prostatic surgery are dealt with in an impartial manner, with adequate coverage of the transurethral, perineal, and suprapubic methods. The portions dealing with treatment of urinary tract trauma should be of benefit to military surgeons. This book should prove to be especially valuable to the man beginning his training in urology and to those surgeons whose training in this field is limited, but who are subject to situations where they are forced to be occasional operators in this region.

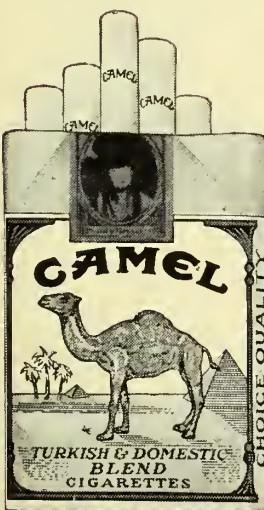
BOMBING MISSION (medical version)



TARGET FOR TODAY...not Japs, but rats...mosquitoes...flies...disease-carrying insects and vermin that infest the steaming jungles of the Pacific.

For this is a *bombing mission in white!* The "bombs" are loaded not with T.N.T., but more likely with D.D.T. which, sprayed from the air, seeks out and kills the adult mosquito and fly.

Yes, with D.D.T., with the aerosol bomb and countless other new developments in sanitation and disease control, the soldiers of medical science are proving themselves fighting men through and through. And, like so many other fighting men, they find pleasure and cheer in a few moments relaxation with a cigarette. Probably a Camel for, according to actual sales records, Camels are the favorite with smokers in *all* the services.



Camels

Costlier Tobaccos

R. J. Reynolds Tobacco Company, Winston-Salem, North Carolina

News Items

The University of Illinois announces that it will conduct its fifth semi-annual refresher course in laryngology, rhinology and otology at the college in Chicago March 26 to 31, inclusive. The class is limited to 30 and applicants will be considered in the order in which they are received. Address Dr. A. R. Hollender, University of Illinois, College of Medicine, 1853 West Polk St., Chicago 12.

Dr. John A. March has arrived in Livingston, Montana, where he will become the associate of Dr. Paul L. Greene in the practice of medicine.

Dr. Fred C. Zapffe, secretary of the Association of American Medical Colleges, spent several days in South Dakota discussing plans for the proposed four-year medical school at the state university. Dr. Zapffe approved of the plans presented by Dr. Ohlmacher, dean of the school of medical sciences, and expressed the opinion that a good, strong medical school could be established in South Dakota.

The officers and councilors of the South Dakota State Medical Association met at Huron, South Dakota, December 17. Dr. Gilbert Cottam and Dr. Triolo of the state board of health met with the council. The 1945 convention was awarded to Watertown for June.

The group discussed association affairs and held a

lengthy session on prepayment plans for medical care. Other discussions centered around the shortage of physicians in the state and distribution of medical care.

President I. D. Weeks of the university and Dr. J. C. Ohlmacher, dean of the University Medical school, spoke on plans to extend the U medical course to four years.

A committee consisting of Dr. H. R. Brown of Watertown, chairman; Dr. C. E. Sherwood of Madison, Dr. C. E. Robbins of Pierre, Dr. R. E. Jernstrom of Rapid City, Dr. R. G. Mayer of Aberdeen and Karl Goldsmith, Pierre lawyer and legal adviser to the group, spent a five-hour session preparing a report on prepayment plans.

Those in attendance included Dr. D. S. Baughman of Madison, president; Dr. William Duncan of Webster, president-elect; Dr. Mayer, secretary-treasurer; Dr. N. J. Nessa, Sioux Falls, delegate; Dr. W. E. Donahoe of Sioux Falls, chairman of council, and the following councilors: Dr. John L. Calene, Aberdeen; Dr. Brown, Dr. George E. Whitson, Madison; Dr. Robbins, Dr. William Saxton, Huron; Dr. J. H. Lloyd, Mitchell; Dr. E. M. Stansbury, Vermillion; Dr. R. V. Overton, Winner; Dr. D. A. Gregory, Milbank. Dr. Ohlmacher is councilor-at-large.

Unable to attend were Dr. F. S. Howe of Deadwood, vice president, and Dr. C. E. Lowe of Mobridge, councilor.

The South Dakota Public Health Association recently elected the following officers: J. M. Butler, M.D., Hot Springs, president; C. E. Sherwood, M.D., Madi-

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GASTRIC FUNCTION

Gastron

REG. U.S. PAT. OFF.

GASTRON is an original extract of the organic and inorganic constituents of the entire mucosa of the hog-stomach, including the pylorus. The acidified and aromatized extract is incorporated in an aqueous-glycerin menstruum which preserves the enzymatic activity. The preparation contains no alcohol. It is accurately standardized by assay.

GASTRON is indicated as replacement therapy in atrophic gastritis, and as an aid in the treatment of chronic gastritis. It is of value as adjunctive treatment in the anemias, and in certain gastric deficiencies associated with convalescence and old age. It is worthy of trial in the nausea and vomiting of pregnancy.

GASTRON with IRON also is available for prescription use.

FAIRCHILD BROTHERS AND FOSTER

70-76 Laight Street, New York 13, N. Y.

son, vice president; Gilbert Cottam, M.D., Pierre, secretary-treasurer; L. M. Young, M.D., Mitchell, and G. L. Hickman, M.D., Bryant, members of the executive committee. The JOURNAL-LANCET has been made the official organ of the association.

The North Dakota Society of Obstetrics and Gynecology met at the Hotel Ryan in Grand Forks on November 18. The program was a symposium on Obstetric Hemorrhage. Papers were presented by Dr. R. E. Leigh, Grand Forks; Dr. W. A. Liebeler, Grand Forks; Dr. B. Urenn, Fargo; Dr. E. M. Ransom, Minot. Dr. R. T. LaVake of Minneapolis discussed the papers. Dr. Frederick Falls, Chicago, read a paper on Causes of Hemorrhages in Pregnancy.

Dr. C. R. Tomkinns, Grafton, North Dakota, was elected president at the annual meeting of the Grand Forks District Medical Society held at the Hotel Ryan December 20. Dr. R. E. Leigh, Grand Forks, was elected vice president; Dr. C. W. Daly, Grand Forks, treasurer; Dr. A. F. Jensen, Grand Forks, was re-elected secretary and Dr. H. E. French, Dean of the University Medical School, was re-elected censor for a three-year term.

The Council of the North Dakota state medical association met in Fargo on Sunday, January 7. The main topic for discussion was the report of the committee on medical economics of which Dr. W. A. Wright is chairman, dealing with the problem of medically sponsored medical insurance plans. The Council agreed to the introduction of an enabling act in the present legislature, which if passed will legalize the formation of a tax-free corporation to sponsor such a plan.

The following officers were elected for 1945 at the annual dinner meeting of the Aberdeen District medical society held January 9: Dr. E. A. Rudolph, president; Dr. T. P. Ranney, vice president; Dr. J. D. Alway (re-elected) secretary-treasurer. Dr. D. S. Baughman, president of the South Dakota state medical association, was present and presented various state association problems. Mr. C. L. Eskelson of Pierre discussed "Vocational Rehabilitation."

The Aberdeen District women's auxiliary met the same evening and elected Mrs. J. L. Calene president, Mrs. R. G. Mayer secretary-treasurer.

New officers of the Chouteau county medical society are: Dr. D. J. Cooper, Big Sandy, president, and Dr. E. L. Anderson, Fort Benton, (re-elected) secretary.

New officers of the Silver Bow county medical association include Dr. Donald L. Gillespie, president; Dr. Peter Spurck, vice president; Dr. S. V. Wilking, (re-elected) secretary.

Dr. John A. March, formerly practicing at Three Forks, Montana, has moved to Livingston.

The Public Health League of Montana has reorganized as a permanent institution to keep a watchful eye on any legislation deemed vicious and to sponsor worthwhile legislation. It includes all branches of the healing arts; hospital association, the dental association, nurses association, optometric association, tuberculosis association, cancer association and medical association.

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The following officers were elected at the meeting of the Sixth District Medical society held in Bismarck on December 12. Dr. P. W. Freise, Bismarck, president; Dr. F. F. Vonnegut, Linton, vice president; Dr. W. B. Pierce, Bismarck, secretary-treasurer.

Dr. W. J. Ryan, Duluth, Minnesota, took office as president of the St. Louis County Medical Association December 21. Other officers named for the year are Dr. P. G. Boman, Duluth, president-elect; Dr. T. A. Estrem, Hibbing, vice president, and Dr. R. P. Buckley, Duluth, secretary-treasurer.

The Hospital for Joint Diseases, New York, announces that it has twelve house staff appointments available. This is a general hospital featuring orthopedics. About 6,000 patients are treated annually. The internships are for nine months, the services rotating. Applicants should address Director, Hospital for Joint Diseases, 1919 Madison Ave., New York 35, New York.

At the annual meeting of the Yankton (North Dakota) District Medical society the following officers were elected for the new year: Dr. Edward Joyce, Hurley, president; Dr. A. P. Reding, Marion, vice president; Dr. J. A. Hohf, Yankton, re-elected secretary-treasurer.

Dr. J. W. Bowen was elected president of the Southwestern District Medical association at a meeting of the group held at Dickinson December 16. Other officers were: Dr. Hans Guloen, vice president; Dr. H. L. Reichert, secretary-treasurer.

The shortage of doctors in South Dakota has become alarming. This decline began in 1915 and has of course been accelerated by the War. There is now only one physician for every 1,266 persons whereas in the country as a whole there is one for every 824.

Dr. O. S. Randall has been notified of his election as a member of the Western Surgical association at the meeting held in Chicago on December 2.

Dr. C. J. Watson, professor of medicine, University of Minnesota, spoke to the members of the St. Louis County Medical society at the annual dinner meeting held in Duluth December 7. His subject was "Trends and Postwar Medical Education."

Dr. Andrew Binamark, Hibbing, was elected president of the Range Medical association held at Eveleth. Dr. Bray, Biwabik, was elected vice president, Dr. Frank Bachnik, secretary-treasurer.

A Twin Cities branch of the American Soviet Medicine society was organized December 14 in Minneapolis at a meeting held at the house of Dr. O. H. Wangenstein, head of the department of surgery at the University. Dr. Samuel Corson, Russian-born instructor in physiology, told the meeting that the number of physicians in Russia had increased from 19,000 to 132,000 between 1913 and 1938, and that there were now 716 colleges with 600,000 students, a growth which in his opinion explains the phenomenal rise of Russian medicine within recent years.

Dr. John Cameron, Erskine, Minnesota, was elected president of the Red River Valley Medical society recently; other officers, Dr. O. K. Behr, Crookston, vice president, Dr. C. L. Oppegaard remains as secretary-treasurer.

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- ★ Brucellosis now has been recognized as an important public health problem in this country, according to Carpenter.



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Necrology

Dr. E. B. Maynard, 72, Choteau, Montana, died in his own hospital after a long illness. Dr. Maynard was graduated from the University of Michigan medical school in 1896. He came to Choteau in 1917 where he maintained a hospital and practiced medicine in Pondera and Teton counties.

Dr. A. S. Pinto, 72, Minneapolis, Minn., died at Omaha, Nebraska. Dr. Pinto was one of the first three persons to be bitten by yellow fever carrying mosquito in Cuba where he was in the Third Nebraska infantry in 1892. He served on a Philippine cholera commission from 1900 to 1903, and was in charge of a hospital in France in World War I.

Dr. Thorvald Vaaler, 50, Cannon Falls, Minn., died December 26 at Cannon Falls where he had practiced for 15 years. Dr. Vaaler was a graduate of the University of Minnesota medical school.

Dr. John L. Lee, 49, Alexandria, Minnesota, died December 17 at the home of his brother in Edina, Minnesota. He had practiced in Watertown, Minnesota, where he was a member of the American Legion post, until a year ago when he opened a practice in Alexandria.

Dr. Ernest Z. Wanous, 69, Minneapolis, Minn., died at his home Jan. 5, after a lingering illness.

Dr. L. E. Daugherty, 64, St. Paul, Minnesota, died January 10th at St. Luke's Hospital. He practiced in St. Paul for thirty-five years.

Dr. Carl F. Bassow, 61, Ft. Benton, Montana, died of lobar pneumonia at his home, January 5th. Dr. Bassow came to Ft. Benton in 1910.

Dr. Peter Kraft, 78, Duluth, Minnesota, died January 12th at his home in Duluth after a lingering illness. Dr. Kraft, born in Germany, was graduated from medical school in Munich and Wurtzberg.

Dr. W. L. Meng, 65, Fergus Falls, Minnesota, died January 9th. Dr. Meng was a member of the staff of the State Hospital.

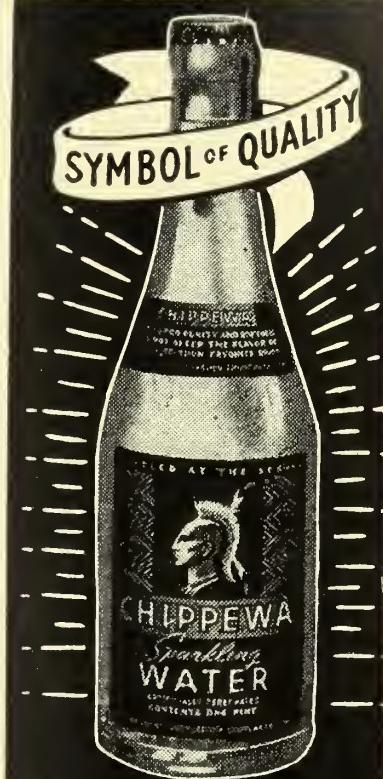
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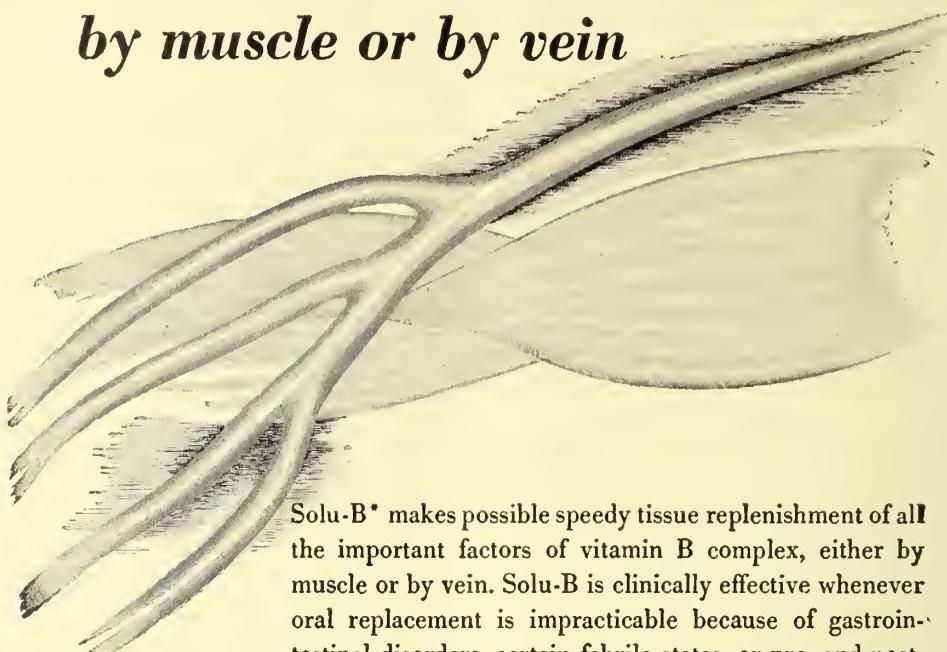
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Minneapolis, Minnesota
March, 1945

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New Series

Penicillin in Surgery*

W. A. Altemeier, M.D.†

Cincinnati, Ohio

PENICILLIN is a very effective and useful chemotherapeutic agent in the treatment of surgical infections commonly encountered in the practice of surgery. Its superiority to the various sulfonamides in the treatment of *staphylococcus aureus* infections with or without bacteremia is unquestionable, and it has also been very effective in the therapy of infections caused by the hemolytic streptococcus, the pneumococcus, and the gonococcus which were previously found to be resistant to the action of the sulfonamides.¹ In addition experiments have shown the action of penicillin to be equally great under both aerobic and anaerobic conditions.²

Penicillin is a potent antibacterial substance produced by the mold, *Penicillium notatum*. Although it was discovered, named, and studied by Fleming³ in 1929, it was not until 1940⁴ and 1941⁵ that Florey and his associates developed a method of preparing a purified material on a small scale mass production which was suitable for clinical trial. Further improvements in methods of production in the United States have greatly increased the yield and supply of penicillin.

All penicillin now being produced is allocated by the War Production Board to the Army, Navy, United States Public Health Service, and the Office of Scientific Research and Development. Penicillin used in civilian cases is distributed by the Office of Scientific Research and Development for experimental and clinical studies which are carried out under supervision and co-ordination by the committee on chemotherapeutic and

other agents of the National Research Council. Since November 1942 we have received sodium and calcium salts of penicillin from this source.

Sodium penicillin is a yellow or golden granular powder which is hygroscopic and readily soluble in water, producing a clear amber solution. It is relatively unstable, and its activity is diminished or destroyed by heat, acids, oxidizing agents, and reducing agents. The penicillin distributed recently has been more stable than earlier lots. Calcium penicillin is similar in appearance, solubility, and effect, and is relatively stable. Early reports of Florey^{5,15} indicated that the calcium salt was more toxic and therefore safe for topical use but unsafe for parenteral use. However, more recent clinical experience in this country has shown the calcium salt to be safe as well as effective for intramuscular or intravenous administration.^{7,2} The remarkable nontoxic nature of the sodium salt of penicillin *in vitro* and *in vivo* has been repeatedly emphasized.^{2,3,4,5,6,8,9,10} The parenteral administration in clinical cases is associated with a very low incidence of systemic or local reactions. Chills, fever, urticaria, angio-neurotic edema, headache, local thrombophlebitis and muscular pain at the site of injection have been occasionally noted. There is considerable evidence to indicate that these reactions are caused by toxic impurities and not by the penicillin. For example, in instances of chills and fever following the intravenous administration of solutions of penicillin, we have observed that filtration through a Berkefeld filter removes the pyrogenic substances, and the administration of the filtrate is not followed by chills or fever. Likewise we have found that one lot of penicillin may cause reactions whereas other lots from different firms may not produce these or other toxic reactions in the same patient. (Fig. 1).

*From the Department of Surgery, College of Medicine of the University of Cincinnati, and the Cincinnati General Hospital.

†The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the University of Cincinnati. Read before the National Meeting of the American Student Health Association March 15, 1944. Permission to publish has been granted by the Committee on Medical Research.

The nature of the action of penicillin is not clear but it seems to be either bacteriostatic or bactericidal, occurring in extraordinarily high dilutions.¹⁰ It is many thousand times more effective in vitro than any of the sulfonamides. In general it is very effective against gram-positive bacteria, and a few gram-negative types such as gonococci and meningococci. Recently our tests have shown another gram-negative bacterium, *B. alkaligenes* *fecalis*, to be completely inhibited by .05 units of penicillin.² The microorganisms sensitive to the action of penicillin are shown in table 1 and those resistant to its action in table 2. These lists were compiled from published reports and results of experiments conducted in our own laboratory.

It is advisable to determine the sensitivity of the various bacteria associated with an infection to be treated by penicillin and this can be done simply in one of several ways. We have usually used the gutter-plate method and have found it to be very practical for both aerobes and anaerobes. A trough of agar 1 cm. in width is carefully and aseptically removed from the center of an agar plate. The various bacteria to be tested are then individually streaked across the plate. The trough is filled with melted agar containing 1 or 2 units of penicillin per cubic centimeter. After incubation bacteria resistant to the action of penicillin grow up to the edge of the trough, while those sensitive to its action are inhibited for a distance dependent upon the degree of sensitivity. (Figs. 2, 3, and 4).

Since it is known that an inhibitory effect is exerted upon the sulfonamides by blood, pus, par-amino benzoic acid, novocaine and the products of tissue autolysis, similar effects were looked for on penicillin. None was found and this gives penicillin an additional advantage over the sulfonamides as a chemotherapeutic agent. However, Abraham and Chain¹² found that certain extracts of *B. coli* contained an enzyme, penicillinase, which destroyed the bacteriostatic property of penicillin. Studies conducted in our laboratory have shown that actively growing cultures of various gram-negative bacteria such as *B. coli*, *B. pyocyanus*, and *A. aerogenes* rapidly and completely destroy the activity of penicillin.¹³

METHODS OF ADMINISTRATION

Penicillin has been distributed in ampules or vials containing 1,000, 5,000, 10,000, 25,000 and 100,000 units. More recently only vials containing 100,000 units have

been received. It may be prepared as a solution for clinical use by the addition of enough sterile physiological saline solution to make a standard concentration of 5,000 units per cc. When administered intravenously or intramuscularly in this form it is readily absorbed but rather

PENICILLIN ACTIVITY IN VITRO

Table 1
Sensitive

Gonococcus	Micrococcus	<i>B. pseudodiphtheriae</i>
Meningococcus	<i>B. subtilis</i>	<i>Lactobacillus</i>
Streptococcus	<i>C. tetani</i>	<i>Cryptococcus hominis</i>
hemolytic	<i>C. welchii</i>	<i>Streptobacillus</i>
<i>viridans</i>	<i>C. histolyticus</i>	<i>moniliformis</i>
microaerophilic	<i>C. septicum</i>	<i>Actinomyces bovis</i>
anaerobic	<i>C. sordelli</i>	<i>Spirillum rubrum</i>
Staphylococcus	<i>C. oedematiens</i>	<i>B. alkaligenes</i>
<i>aureus</i>	<i>C. sporogenes</i>	<i>Borrelia novyi</i>
<i>albus</i>	<i>B. diphtheriae</i>	
anaerobic		

Table 2
Resistant Strains of Microorganisms

<i>B. coli</i>	<i>A. aerogenes</i>	<i>B. tuleranse</i>
<i>H. influenzae</i>	<i>B. fluorescens</i>	<i>Br. melitensis</i>
<i>B. typhosus</i>	<i>B. friedlander</i>	<i>Br. abortus</i>
<i>B. paratyphosus</i>	<i>B. prodigiosus</i>	<i>B. melaninogenicum</i>
<i>B. dysenteriae</i>	<i>B. pestis</i>	<i>Monilia albicans</i>
<i>B. proteus</i>	<i>Vibrio cholera</i>	<i>Monilia candida</i>
<i>B. enteritidis</i>	<i>Acne bacillus</i>	<i>Kurthia zenderi</i>
<i>B. pyocyanus</i>	<i>M. tuberculosis</i>	<i>L. icterchemorrhagiae</i>

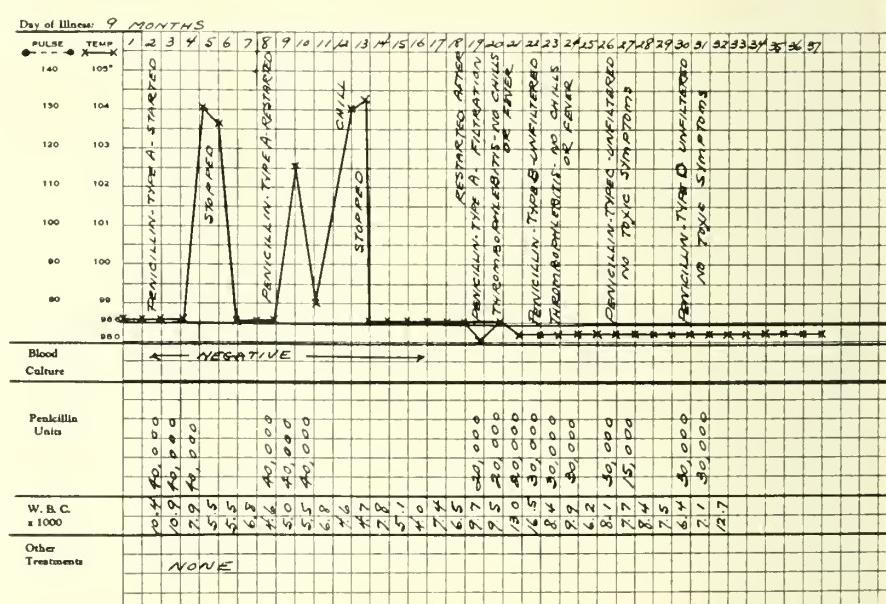


Fig. 1. Illustrating toxicity of penicillin caused by filterable impurities. Chills and fever produced by one lot of penicillin in a case of chronic osteomyelitis did not occur after filtration of the same material. Preparations from three other manufacturers did not cause toxic reactions in this patient.

quickly excreted in the urine. Rammelkamp and Keefer⁹ and Dawson, Hobby, Meyer, and Chaffee¹¹ have shown that the intravenous administration of penicillin produces an immediate high rise and very rapid fall in the level of penicillin in the serum. Intramuscular administration produces a rather rapid rise to a lower but more sustained blood level than that produced by intravenous injection. Subcutaneous injection results in a prolonged delay in the appearance of penicillin in the blood stream and a very low level, making this route of administration un-

satisfactory for therapy. The rapid disappearance of penicillin from the blood and its rapid excretion in the urine make necessary the administration of penicillin by continuous intravenous drip or by repeated intramuscular or intravenous injections at intervals of not more than three or four hours.

The oral administration of penicillin is ineffective⁸ because it is rapidly destroyed by acid in the stomach. Rectal absorption is poor⁸ and this may be explained by the inactivation of penicillin by feces and extracts of *E. coli* or other gram-negative intestinal bacteria. Absorption from the intestine is greatest following intraduodenal administration which produces a maximum blood plasma

E. COLI

STAPHYLOCOCCUS

STREPTOCOCCUS

PNEUMOCOCCUS

level in five to fifteen minutes and gives an absorption concentration curve similar to that obtained by intramuscular injection.

In meningitis and localized infections such as soft tissue abscesses, infected burns, pleural empyema and purulent arthritis, penicillin in solution should be used locally. When injected into spaces such as infected bursae, joints, or pleural cavities, its absorption is delayed and appreciable concentrations remain thirteen to twenty-two hours after injection.^{9,14} In two of our cases of meningitis, the presence of penicillin was easily demonstrated twenty-six to thirty-two hours after intrathecal administration.

The dosage of penicillin administered parenterally is varied with the nature of the infection, type of patient, and method of administration. Staphylococcal infections usually require a higher dosage than streptococcal infections, and gonococcal the least. In the average severe staphylococcal infections with or without bacteremia we have varied the dosage with the route of parenteral administrations, such as:

1. Continuous intravenous injection of a solution containing 40,000 to 80,000 units of penicillin in 2,000 cc. of physiological saline or 5 per cent glucose solution at the rate of 25 to 30 drops per minute.

2. Repeated small injections intravenously or intramuscularly of 10,000 or 20,000 units at intervals of two to four hours. For this method of administration a solution of 5,000 units per cc. in physiological saline may be used. Both of the above methods have been very effective.

The dosage employed for local or topical administration is also varied with the nature and location of the infection. Monomicrobic infections of wounds or other lesions sensitive to penicillin usually respond to solutions

containing 250 units per cc. Polymicrobic infections associated with both gram-negative and gram-positive bacteria require higher concentrations up to 500 or 1,000 units per cc. Purulent exudates should be removed by incision, aspiration, or irrigation before the local application of penicillin for best results.

In the treatment of invasive infections originating from lesions associated with the local breakdown of tissue, the

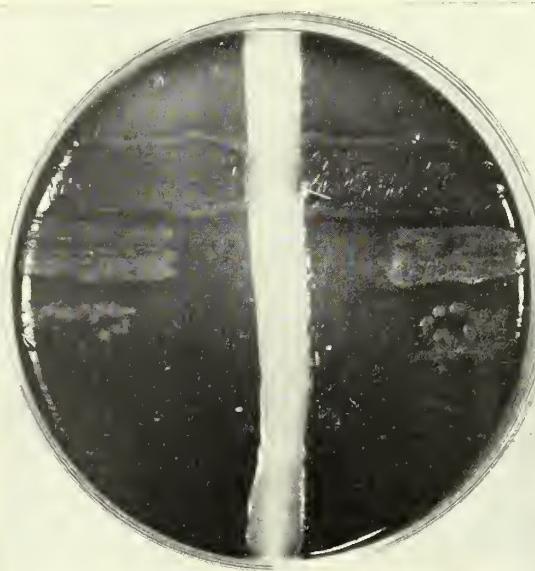


Fig. 2. Showing relative sensitivity of various common organisms to penicillin using gutter-plate method.

combined parenteral and topical administration of penicillin is indicated whenever possible.

The effectiveness of penicillin therapy in the control of many infections encountered in the practice of surgery has been very striking. The clinical conditions in which penicillin has been used successfully are indicated in Table 3.

Table 3
Penicillin Therapy—Clinical Indications

I. Staphylococcal infections:	II. Pneumococcal infections (sulfonamide-resistant)
1. Bacteremia or septicemia	1. Bacteremia or septicemia
2. Meningitis	2. Pneumonitis
3. Epidural abscess	3. Meningitis
4. Brain abscess	4. Empyema
5. Acute osteomyelitis	5. Suppurative arthritis
6. Chronic osteomyelitis	6. Pericarditis
7. Septic arthritis	
8. Skin: carbuncles, furuncles, cellulitis	
9. Oral or pharyngeal cellulitis	
10. Parotitis	
11. Burns	
12. Parotitis	
13. Cavernous or lateral sinus thrombosis	
14. Pneumonitis	
15. Pulmonary abscess	
16. Blepharitis, conjunctivitis, dacryosystitis	
17. Wound infections, acute and chronic	
18. Hand infections	
19. Suppurative bursitis	
III. Streptococcal infections (sulfonamide-resistant)	
	1. Bacteremia or septicemia
	2. Cellulitis
	3. Meningitis
	4. Mastoiditis
	5. Lateral sinus thrombosis
	6. Empyema
	7. Postpartum sepsis
	8. Infected abortion
	9. Pericarditis
	10. Brain abscess
	11. Anaerobic Streptococcal infections
IV. Miscellaneous	
	1. Gonococcal infections (sulfonamide-resistant)
	2. Rat-bite fever
	3. Actinomycosis
	4. Gas gangrene
	5. Human bite infections

The intelligent use of penicillin has significantly reduced the high mortality rate which has heretofore been associated with invasive staphylococcal infections with bacteremia.

The outcome in the individual case is dependent upon many factors including early and accurate diagnosis, early and adequate treatment, age of the patient, susceptibility of the strain of staphylococcus to penicillin, site and nature of the primary infection, duration of the bacteremia, presence and location of secondary or metastatic abscesses, accessibility of the primary or secondary infections to surgical drainage, and the presence of other associated and complicating diseases. Experience has shown that treatment is most successful in young adults or children in whom the diagnosis of staphylococcal bacteremia is made early, penicillin therapy given early and intensively, and surgical drainage is possible when indicated. If acute staphylococcal vegetative endocarditis occurs, penicillin therapy has not been effective and death invariably has occurred in our experience. Relapse may occur if inadequate amounts or prolonged intervals between injections are used.

Two examples of the excellent results obtained with penicillin therapy in severe invasive staphylococcal infections with bacteremia are illustrated in cases 1 and 2.

Case 1. M. H., age 18 years, was admitted to the hospital with an extensive acute cellulitis of the face and a hemolytic staphylococcus aureus bacteremia. Two days before admission she had traumatized a small pustule on her cheek, and one day before swelling of the right half of the face occurred followed by high fever. Blood cultures were positive for the hemolytic staphylococcus aureus. Sulfadiazine administered intravenously did not affect the course of the illness and the cellulitis of the face and delirium increased. On the third hospital day penicillin therapy was started, 12,500 units being administered every twenty-four hours for four days. The blood cultures became negative in forty-eight hours and remained so. The cellulitis subsided, the temperature fell, the patient became oriented and recovery was rapid and uneventful. (Fig. 5).

Case 2. S. W., age 12 years, was admitted to the hospital with an infected patent ductus arteriosus and a staphylococcus aureus septicemia. She received 1,500,000 units of penicillin starting on the fifth day of her illness and made a complete recovery. Eighty-six days after admission to the hospital the patent ductus arteriosus was exposed and successfully ligated by Dr. E. McGrath. The patient has since remained well. (Fig. 6).

In cases 3 and 4, penicillin therapy failed and the reasons are obvious. In the former, the invading staphylococcus aureus was resistant to the action of penicillin, and in the latter acute vegetative endocarditis was a complication.

Case 3. E. N., age 11 years, was admitted to the hospital with extensive second and third degree burns involving 60 per cent of the body surface. The burns were treated by removal of blisters and dead skin, cleansing, and application of the ointment-pressure dressing. Postoperatively she received oxygen, sulfadiazine, blood plasma, and fluid therapy. Her course was stormy from the start and the temperature rose gradually until the sixth postoperative day when it reached 104.6. At this time a blood culture taken was found to be positive for hemolytic staphylococcus aureus. Intensive penicillin therapy was started giving 15,000 units every three hours for a total of 985,000 units. Her course remained stormy and blood cultures remained positive. Laboratory tests showed the infecting staphylococcus aureus to be a strain resistant to the action of penicillin. Death occurred on the twenty-sixth day. (Fig. 7).

Case 4. W. H., age 42 years, was admitted to the hospital with staphylococcal bacteremia secondary to a carbuncle on the left forearm. Penicillin therapy was started fourteen days after the onset of illness giving 15,000 units every four hours and then every three hours for a total of 1,085,000 units. Blood cultures were only temporarily sterilized. Seventeen days later a definite murmur was heard over the tricuspid area for the first time and death occurred within two days. Autopsy revealed vegetative endocarditis (staphylococcal). (Fig. 8).

The effectiveness of penicillin therapy in acute hematogenous osteomyelitis has been brilliant. Early intensive treatment with penicillin in acute osteomyelitis of the long bones in our experience has been followed by such prompt and complete clinical recovery that surgical drainage has not been necessary except in unusual instances. Early diagnosis is of primary importance, and when followed by early treatment, minimal destruction of the infected bone is the result. Case 5 illustrates the great advance in the management of acute osteomyelitis that has occurred with early diagnosis and adequate penicillin therapy without surgical intervention.

Case 5. K. M., age 13 years, was admitted to the hospital with acute hematogenous osteomyelitis of the right femur and left tibia, hemolytic staphylococcus aureus bacteremia, and staphylococcal pneumonitis. Intensive penicillin therapy was started on the fourth day of illness and was followed by complete recovery. Surgical intervention was not necessary and all local signs of inflammation rapidly disappeared. Progress x-ray examinations have shown the incidence of residual bone damage to be minimal and stationary. (Fig. 9).

If the diagnosis is delayed, however, thrombosis of the nutrient vessels followed by extensive destruction of the bone will occur.

The action of penicillin in chronic staphylococcal infections has not been as prompt nor as gratifying as that in the acute cases. The general and local administration of relatively large doses of penicillin has frequently failed to cause healing or the disappearance of the hemolytic staphylococcus aureus from the deeper portions of the wound. Without surgery penicillin has usually had little or no effect on the course of the chronic osteomyelitic process of long bones. When used in association with surgical drainage, sequestrectomy, or other indicated surgical procedures, the use of general and topical penicillin therapy has been of benefit.

The value of penicillin in the control of diabetic patients with infections has become increasingly apparent to us. This has been particularly true in staphylococcus infections and infections of the lower extremities when penicillin was used as an adjunct to surgery.

Our experience with penicillin in the treatment of hemolytic streptococcal, pneumococcal and gonococcal infections has been very limited. Most of these infections have responded so promptly to sulfonamide therapy that penicillin therapy was seldom indicated. In the cases of sulfonamide-resistant infections which we have treated, the action of penicillin has usually been very impressive.

The successful management of either staphylococcal or streptococcal bacteremia associated with puerperal sepsis or other infections of the genital tract has been greatly facilitated by penicillin. Its effectiveness in a

severe anaerobic streptococcus bactemia is illustrated in case 6.

Case 6. G. S., age 52 years, underwent operative removal of the cervix and repair of a cystocele and rectocele on January 5, 1944. The body of the uterus had been removed in 1932. On

RESISTANT STAPH. →

NON-RESISTANT STAPH. →

the third postoperative day a fine rash was noted on the back and wrists and this increased in intensity and extent. The cutaneous lesions became large indurated red macular, vesicular, and pustular areas distributed over the entire body, including palms of the hand. There was marked prostration, severe toxemia, high fever, coma, and evidence of pneumonia. Blood culture was positive for nonhemolytic anaerobic streptococcus. No clinical improvement was noted during therapy with sulfathiazole or sulfamerazine. A good but somewhat delayed response to penicillin occurred and the patient made a complete recovery. (Fig. 10).

Experimental studies at this clinic and elsewhere have shown that penicillin is a powerful agent in *C. welchii* infections, being far superior to the sulfonamides. We have treated three severe cases of gas gangrene successfully by penicillin and amputation, and one with multiple incisions and penicillin.

The response of two cases of rat-bite fever was definite. In each the administration of penicillin was followed within twenty-four hours by the permanent disappearance of the streptobacillus moniliformis from the blood stream, prompt fading of the cutaneous rash, and clinical improvement. In a third case the blood culture was sterilized but later became positive after an inadequate amount of penicillin was given.

In the management of actinomycosis with penicillin, the results are encouraging but not conclusive. Definite improvement with regression of the process was noted in four cases, one pulmonary and three abdominal. No complete cures have been obtained.

SUMMARY

Penicillin is a very effective and useful agent in the treatment of infections commonly encountered in the practice of surgery. It can be used intravenously, intramuscularly, intrathecally, intrapleurally, or topically, but is ineffective when administered by mouth. Toxic reactions are rare and apparently due to impurities.

After parenteral administration, penicillin is excreted so rapidly in the urine that it is necessary to inject it continuously or at intervals of two to four hours to insure a continuous therapeutic level in the circulating blood and body tissues.

It is much more effective than the sulfonamides in the treatment of infections caused by the staphylococcus as well as those by the gonococcus, hemolytic streptococcus, and pneumococcus and it has been particularly useful in the cases of infection caused by these bacteria which are resistant to sulfonamide therapy.

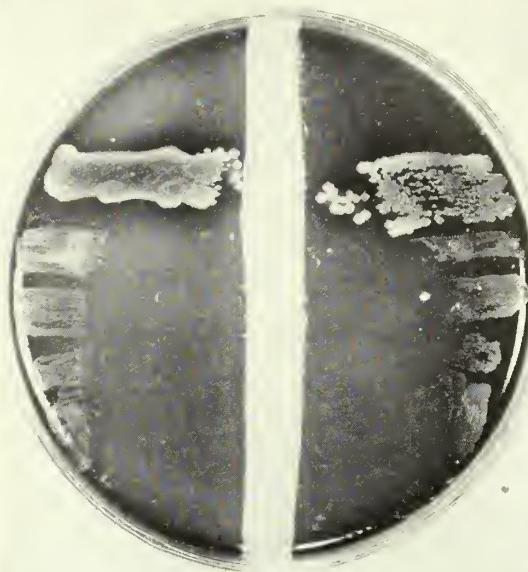
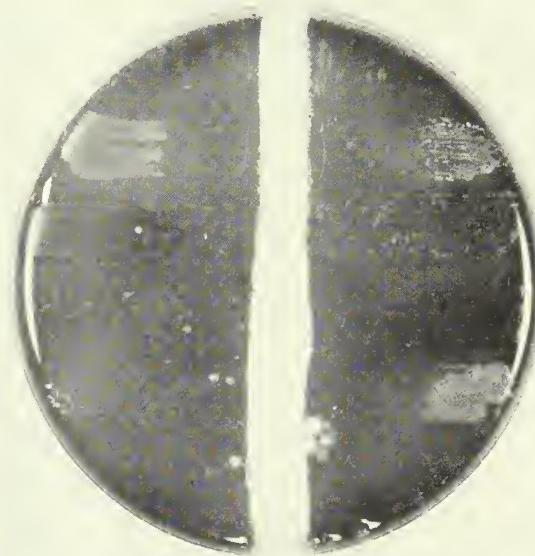


Fig. 3. Showing action response of resistant and susceptible strains of staphylococci to penicillin.

In our experience penicillin has been strikingly effective in diffuse or generalized staphylococcal infections which have been diagnosed and treated early with penicillin with the exception of those caused by a resistant strain of staphylococcus or those complicated by acute vegetative endocarditis.



ANAEROBIC STREPT.

Fig. 4. Showing sensitivity of four strains of anaerobic streptococci to penicillin.

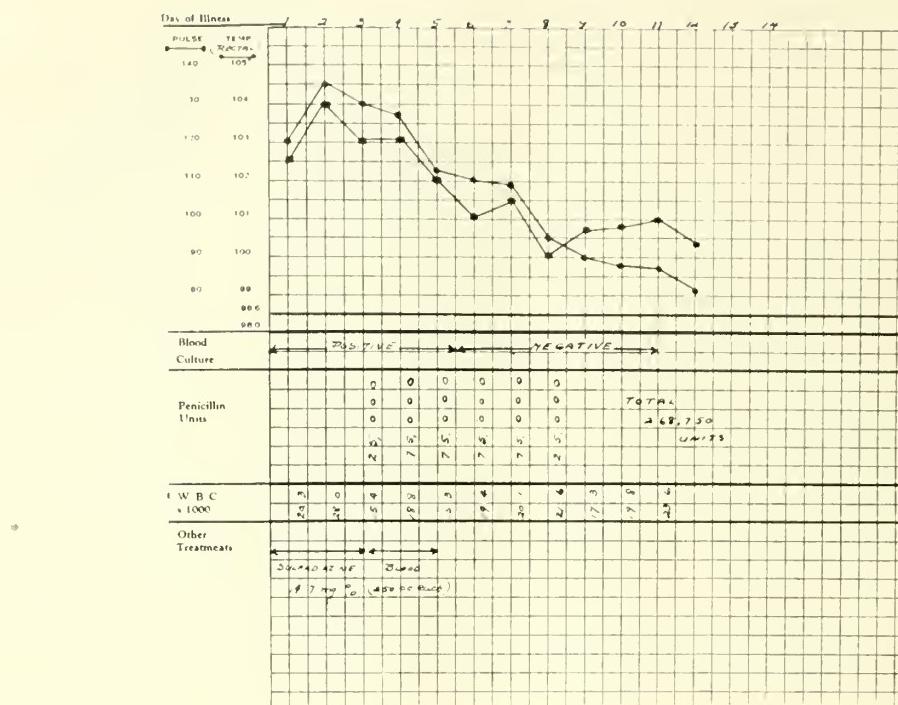


Fig. 5. M. H., age 18 years.
Diagnosis: 1. Cellulitis of face. 2. Hemolytic staphylococcus aureus bacteremia.

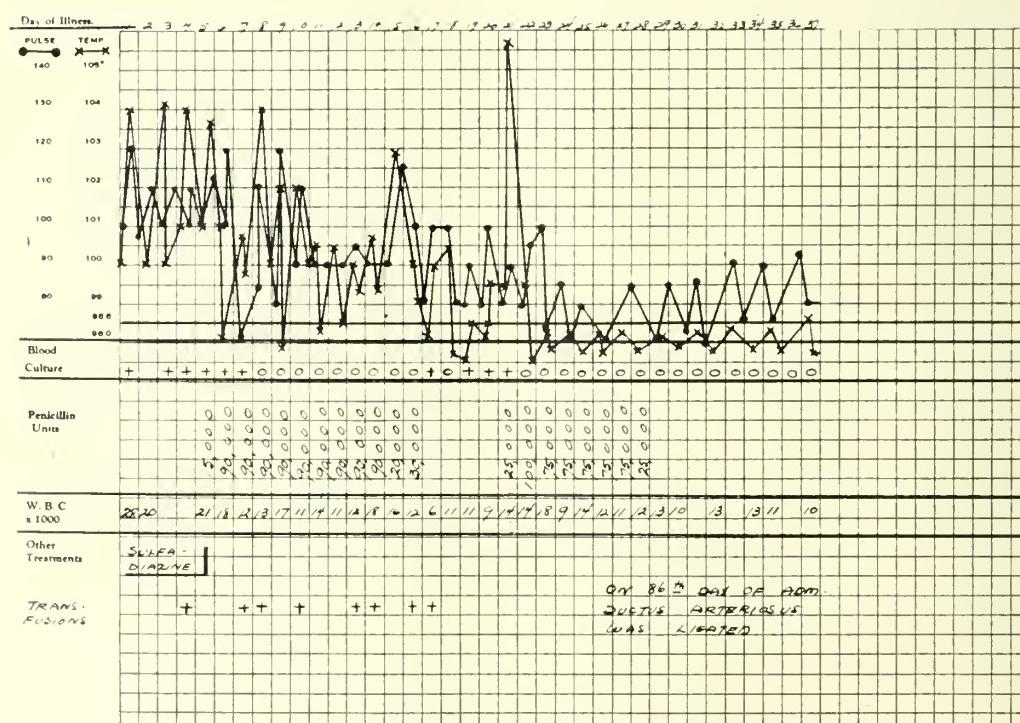


Fig. 6. S. W., age 12 years.
Diagnosis: 1. Infected patent ductus arteriosus. 2. *Staphylococcus aureus* bacteremia.

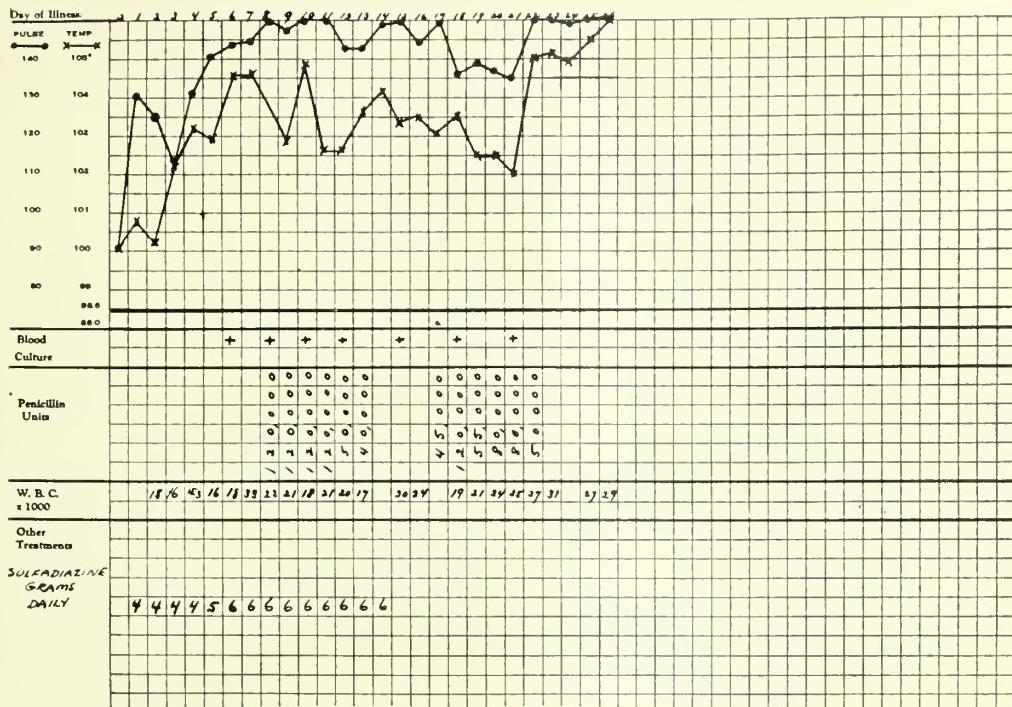


Fig. 7. E. N., age 11 years.
Diagnosis: 1. Extensive second and third degree cutaneous burns. 2. Staphylococcus aureus bacteremia.

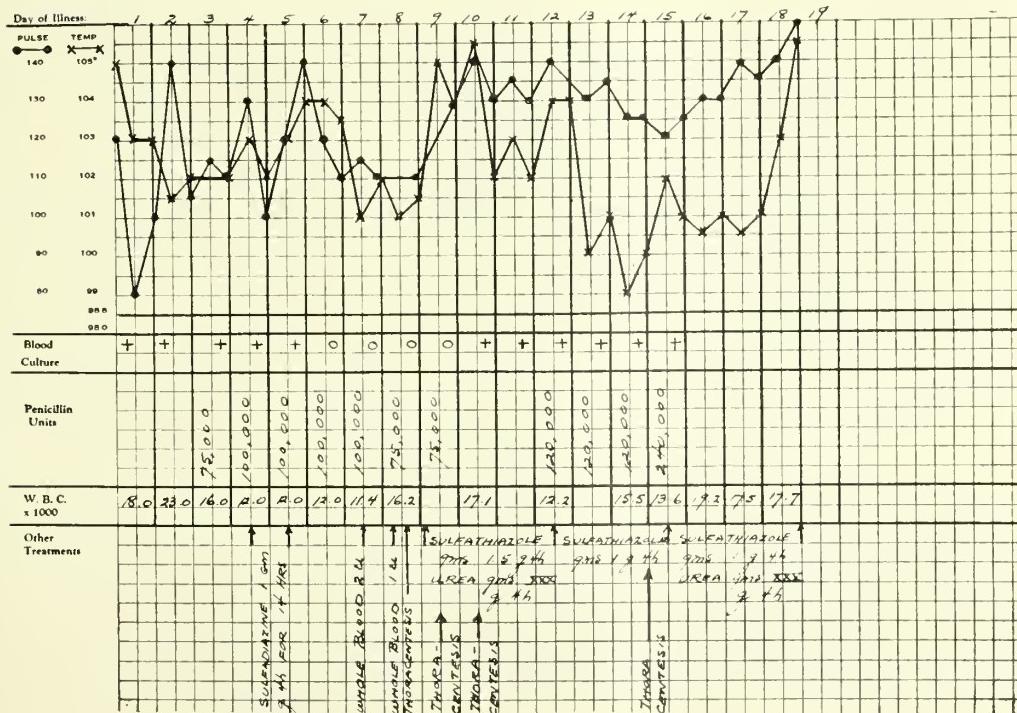


Fig. 8. W. H., age 42 years.
Diagnosis: 1. Small carbuncle of arm. 2. Staphylococcus aureus bacteremia. 3. Acute vegetative endocarditis.

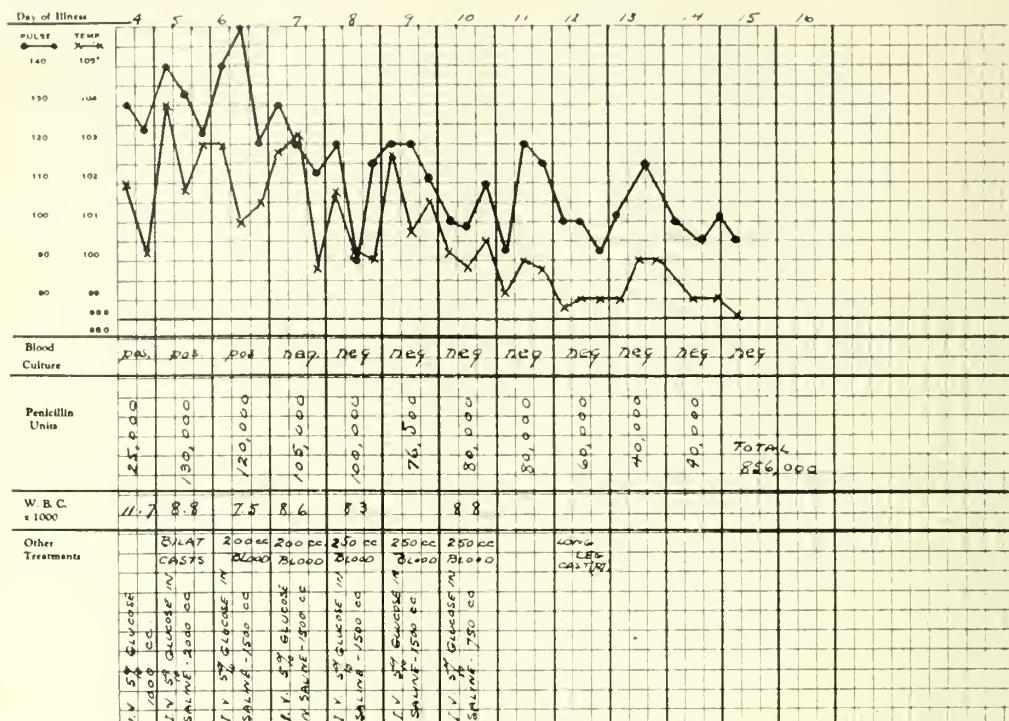


Fig. 9. K. M., age 13 years.
 Diagnosis: 1. Acute hematogenous osteomyelitis of right femur and left tibia.
 2. *Staphylococcus aureus* bacteraemia. 3. Staphylococcal pneumonia.

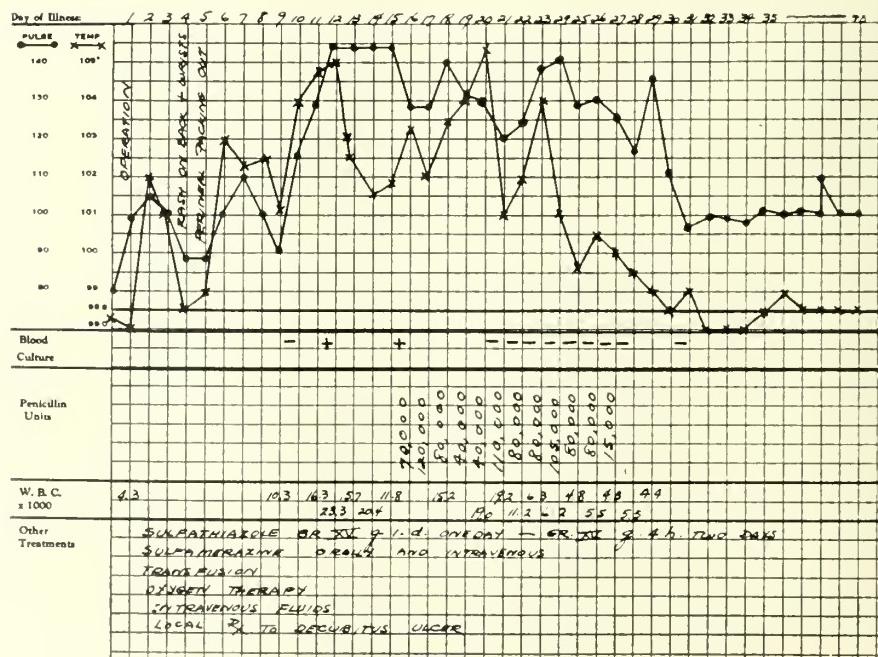


Fig. 10. G. S., age 52 years.
Diagnosis: Anaerobic streptococcus bacteremia

The success of adequate penicillin therapy in the management of established staphylococcal infections with bacteremia seems to be largely dependent upon the age of the individual, the site of the primary infection, the susceptibility of the bacterial strain to penicillin, the duration of the bacteremia, the presence and location of secondary abscesses to surgical drainage, and the presence of concomitant diseases.

The results in twenty cases of acute osteomyelitis have been very impressive and they indicate that early intensive penicillin therapy may be followed by such prompt and complete disappearance of clinical symptoms and arrest of bone destruction that surgical intervention frequently becomes unnecessary.

In addition to infections caused by the staphylococcus, the streptococcus and the pneumococcus, penicillin also aids in the treatment of gas gangrene, actinomycosis and rat-bite fever.

The great majority of infections treated by the surgeon are caused by the staphylococcus, the streptococcus, and the gonococcus. The early treatment of diffuse infections caused by any of these microorganisms may be followed by such prompt and complete arrest of the destructive bacterial processes that suppuration does not develop and surgical intervention does not become necessary. In the treatment of suppurating surgical infections caused by these bacteria, penicillin therapy has had a striking beneficial effect on mortality and morbidity, but

the fundamental surgical principles of early accurate diagnosis, early treatment, rest, adequate external drainage and vigilant supportive treatment remain as important as ever.

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The Present-day Status of Contraception*

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NOWHERE is the lag between the law and the mores of the American people more obvious than in the legal restrictions touching on birth control. Although over 90 per cent of the American people use contraceptive techniques of one sort or another without regard to applicable legal canons, the federal government and more than half the states have enacted various laws regulating the distribution of contraceptives and of information about them. These laws range from outright prohibitions to salutary attempts to assure a better product by means of licensing.

Because of the peculiar properties of contraceptives and the intimate aspect of the whole problem, the chief result of the most restrictive laws has been to put a premium on the use of inferior methods free from the supervision of the medical profession. Minnesota fortunately is among the forward-looking states where physicians have been free to work out intelligent programs

using contraception as a therapeutic technique without danger of prosecution.

Until 1873 the legislatures of the country had not attempted to superimpose repressive laws on this most intimate of all individual and personal choices. In that year, Anthony Comstock descended upon Congress with a supply of obscene post cards and a host of good intentions. By means of his sensational exhibits and obvious sincerity he persuaded the legislators that they must do something if the country as a whole was to be saved from the clutches of organized vice.

A bill was introduced which made it criminal to import, mail or transport in interstate commerce (the only field in which the federal government has police powers other than with reference to the internal affairs of the territories and the District of Columbia) "obscene literature and articles of immoral use." The bill included in this category "any article or medicine for the prevention of conception or for causing abortion" but it made an express exception for such articles when circulated, etc., "on the prescription of a physician in good standing,

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given in good faith." For some reason, which has never come to light, perhaps because it was thought to be unnecessary, this exception was dropped from subsequent versions of the bill and the law which was finally passed, with little or no discussion, did not contain it.

Sporadic efforts were made to enforce the federal laws, but most of them showed up the absurdity of the laws so clearly that the court cases resulted in repeated judicial liberalization of the federal prohibitions. Thus, in 1930, despite the absolute wording of the federal law, it was implied that it would be invoked only against the transmission of contraceptives "for illegal contraception" and would not be construed to prevent their "proper medical use."¹ This implication became a straight holding three years later when another circuit court of appeals held that obviously druggists who act as a source of supply for the medical profession were not intended to be included in the ban.²

In December, 1936, final clarification was obtained in a case involving the importation of pessaries by Dr. Hannah M. Stone, a leader in the field of medical contraception. In handing down its decision the Court read an exception into the federal statutes for "the importation, sale or carriage by mail of things which might intelligently be employed by conscientious and competent physicians for the purpose of saving life and promoting the well being of their patients."³

At the time it was originally passed, the federal act started a fashion and a number of states followed suit by enacting little "Comstock laws" of their own designed to prevent everything from the distribution of "secret drugs and nostrums" for conception to the use of any article for contraceptive purposes.

Some of the state statutes, including the Minnesota law, have from the beginning contained exceptions for the medical profession, and, in such states there has been no need for the process of judicial liberalization, which has resulted in the recognition that such an exception exists, by implication, in the federal law. Sections 10188 and 10189,⁴ of the Minnesota statutes on Indecent Articles and the Mailing and Carrying of Obscene Matter, states:

"But the provisions of this section (10189) and No. 10188 shall not be construed to apply to an article or instrument used by physicians lawfully practicing, or by their direction or prescription, for the cure or prevention of disease."

By reason of the foregoing exception, Minnesota physicians have been free to prescribe contraceptives whenever they believed them to be needed for the health and well-being of their patients.

Fourteen other states also have explicit exceptions for the medical profession. Nineteen others do not have any statutes at all impinging on the general subject of contraception. Thirteen others have statutes clearly aimed

¹ Youngs Rubber Co., Inc., v. C. I. Lee & Co., Inc., 45F (2d) 103 (C.C.A. 2nd, 1930).

² Davis v. U. S., 62F (2d) 473 (C.C.A. 6th, 1933).

³ U. S. v. One Package (Hannah M. Stone, claimant) 86F. (2nd) 737, 739 (C.C.A. 2d, 1936).

⁴ Minn. Stat. (Mason, 1937) Pt. 4, ch. 98, sec. 10187. Obscene Literature. Pt. 4, ch. 98, sec. 10188. Indecent Articles, etc. Pt. 4, ch. 98 sec. 10188. Mailing and Carrying Obscene Matter.

at the indiscriminate advertising and sale of contraceptives, but by implication and/or construction they have not been applied to medical practice. Only in Massachusetts and Connecticut has it been held that the laws prohibit the giving of contraceptive information for any cause whatever. The Connecticut statute goes so far as to prohibit the use of any contraceptive. Obviously, the crime of use is virtually impossible to prove, but the Connecticut prosecuting authorities have got around this by proceeding against doctors and nurses as accessories to the crime of use. Unfortunately, both in Connecticut and Massachusetts prosecutions against the medical profession for the prescription of contraceptives to preserve health and protect life have been successful.

With all the clinics closed and the need for contraceptive advice growing constantly, a courageous Connecticut doctor brought an action for a declaratory judgment to the effect that the statute would not be construed to interfere with his prescription of contraceptives for patients for whom pregnancy would mean either death or serious illness.

As in the case of similar actions in Massachusetts the highest state court upheld the validity of the statute even so construed. By a vote of three to two the court concluded that total abstinence was the only solution.⁵

The actual result of the absolute ban of contraceptives in both Connecticut and Massachusetts has been the widespread sale and use of the least desirable types of contraceptives (which may serve other purposes, such as the prevention of disease) and only the best types of contraceptives—the types which require medical intervention as prerequisite to use—are effectively barred. In Massachusetts today a doctor fits or prescribes a diaphragm at his peril, while condoms, vaginal jellies, douches, etc., of far less efficacy are sold with impunity except in the virtually impossible case when a seller or buyer mentions the fact that the article is to be used for the purpose of contraception and not the prevention of disease!

While federal and state laws have gradually been liberalized, the theory of planned parenthood and child spacing has received increasing support and approval of religious bodies. In a number of statements and resolutions many leading religious groups endorsed the view that the marital sex relation is morally right in itself as an expression of mutual conjugal affection and without relation to procreation, and that the use of measures for the prevention of conception when it becomes necessary for the welfare of mother and child is both ethical and moral.

The progressive recognition by the medical profession of the importance of conception control as a therapeutic and public health measure has been one of the most significant developments in this field during the past twenty years. Many eminent medical men and many medical societies have long recognized that contraception was a necessary and vital part of preventive medicine and that the public was entitled to expert counsel and information on the subject. In 1935, the American Medical

⁵ Tileston v. Ullman, 129 Conn. 87, 26 Atl. (2d) 582 (1942).

Association appointed a "Committee to Study Contraceptive Practices and Related Problems" and in its report, submitted in 1937, this committee stated in part:

"In view of the frequent occurrence of medical indications for the prevention of conception, and in view of the medical complications that arise from ill-advised contraceptive practices resorted to by women on their own initiative and without medical advice, which call for medical care, medical students should, in the opinion of your committee, be instructed fully concerning fertility and sterility and taught the clinical considerations and therapeutic application of contraceptive methods"

"In view of the admitted medical necessity for avoiding conception in certain cases and of the general use of contraceptive preparations and devices, your committee finds no reason why the American Medical Association should not investigate such substances and devices. Such investigations for medical purposes seem to constitute a logical part of the activities of the Association in the field of therapeutic research."

The recommendations of the committee concerning the medical teaching of human fertility and sterility and the investigation of contraceptive methods were then adopted by the House of Delegates of the American Medical Association. A large number of other national, state and county medical societies later passed resolutions pointing out the many indications for contraception and endorsing the use of contraceptive measures when medically indicated. The resolution concerning contraception passed by the House of Delegates at this year's annual meeting of the Minnesota State Medical Association is similar to the one passed by the American Medical Association.

The increasing medical acceptance of planned parenthood has been expressed concretely in the growth of clinical contraceptive services, of medical education in this field, and of the technical developments of methods and procedures.

Twenty-five years ago there was not a single clinical service in this country where contraceptive information was available. In 1919 a special committee organized by Margaret Sanger and Dr. Mary Halton, visited nearly every hospital in New York and inquired of the medical superintendent whether patients suffering from a disease which would make childbearing hazardous for them would be given instruction at the hospital in conception control. With but a single exception, no hospital would accept such patients, claiming that under the law no such information could be given. Some superintendents explained that if it were given, the hospital's charter could be revoked and the doctor giving the advice would be subject to arrest.

Four years later, in 1923, the first birth control center, now known as the Margaret Sanger Research Bureau, was opened in New York. Today, there are some 800 contraceptive services and they are located in practically every state. Many of these services have been initiated through the stimulus and assistance of the Planned Par-

enthood Federation of America⁶ and its affiliated state organizations. All of these centers are under medical direction. About a third of them are supported by local lay committees and are located in settlement houses, church centers and extramural quarters; another third are integrated into state, county and city public health services, while the remaining centers function in hospitals, as a part of the obstetrical and gynecological departments.

The inclusion of child spacing services in public health programs is another significant development. In 1937 the state of North Carolina was first officially to incorporate contraception into its county health services, and in 1939 South Carolina and later Alabama, took similar steps. Five other states have since followed their lead, and several more are now in the process of adopting child spacing as a part of their maternal and infant health programs.

Although the available sources of contraceptive information still fall far short of meeting the need, and large sections of our population are unable to secure adequate medical assistance in family planning, the increasing public support, together with the recent developments in the public health programs is helping to bridge this gulf.

The growing medical interest in contraception has also stimulated the teaching of the subject in medical schools. A generation ago the subject was never mentioned in medical courses, and the graduate physician knew no more—and often far less—about it than the corner druggist. Today nearly 60 per cent⁷ of the approved medical colleges provide some instruction in contraceptive techniques, although the amount and type of instruction in most schools is still inadequate. There are now a number of excellent texts⁸ on the subject and articles dealing with the prevention of conception are published in the leading medical periodicals. There is even a special journal, the *Journal of Human Fertility*, which is devoted primarily to the biological and clinical aspects of human fertility and its control.

At the same time the technical aspects of contraception have been considerably furthered. Older methods have been studied and evaluated and newer and simplified techniques developed. While we are still far from possessing the ideal contraceptive, one that would at the same time be harmless, reliable, simple and inexpensive, the increasing amount of research work in this field holds forth the promise of many improvements.

Significant, too, is the fact that the American Medical Association is now taking an active interest in the evaluation of the efficacy and reliability of contraceptive products. In 1942 the Council on Pharmacy and Chemistry of the Association declared contraceptives eligible for consideration on the same basis as other therapeutic

⁶ The Planned Parenthood Federation of America resulted from an amalgamation in 1939 of the American Birth Control League and the Birth Control Clinical Research Bureau. First known as the Birth Control Federation of America, the organization adopted its present name in 1942.

⁷ Stone, Abraham: "The Teaching of Contraception in Medical Schools." *Human Fertility*, 7: 108-111, August, 1942.

⁸ Copies of Dr. Robert L. Dickinson's "The Techniques of Conception Control" have been sent by the Planned Parenthood Federation to 38,511 physicians in this country at their request.

agents and recently authorized the publication of an authoritative survey of conception control methods in the *Journal of the American Medical Association*.⁹

An advisory committee of authorities in this field was named to assist the Council, and this committee has prepared a set of criteria for the evaluation of contraceptive materials. The council of physical therapy has also decided to receive for consideration and evaluation contraceptive appliances aside from drugs. These actions by official bodies of the American Medical Association will help to provide the medical profession with reliable information on the many contraceptive products which are now being offered by various manufacturers.

The crystallization of public opinion on planned parenthood has been demonstrated by a number of national polls taken in recent years. In July, 1936, for example, *Fortune Magazine* asked a varied sample of American men and women: "Do you believe in the teaching and practice of birth control?" Sixty-three per cent of all those questioned, and 43 per cent of the Roman Catholics, answered: "Yes." "It seems," said *Fortune*, "that the Federal law against the transportation of contraceptives and information thereon and the laws of the several states that in any way or nature attempt to limit

⁹ Dickinson, Robert L.: Conception Control. *Journal Am. Med. Assoc.* 123: 1043-1047, Dec. 18, 1943.

the teaching or practice of birth control, represent the will of only 23 per cent of the public."

Another survey, the results of which were published in the March, 1936, issue of the *Ladies Home Journal*, showed that 79 per cent of American women were in favor of contraception. "From farm and village and city," the report read, "and from every geographical section of the nation rose the affirmative chorus for birth control."

The most recent national survey, conducted by *Fortune* and published in their August, 1943, issue, showed that nearly 85 per cent of women of reproductive ages throughout the country and 68 per cent of the Catholic women, answered yes to the question: "Do you believe that knowledge about birth control should be made available to all married women?"

The present status of contraception in this country is therefore one of practically universal approval and acceptance. A tabooed and prohibited topic a quarter of a century ago, planned parenthood is now emerging as a vital factor in our national and family life and as a health and medical measure of far-reaching importance. It is to be hoped—and it seems likely—that the legal slack will gradually be taken up by intelligent judges and legislators, so that even the last vestiges of taboo and prohibition will be a thing of the past.

Neurotic Problems in a Student Practice*

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TO every physician in the practice of medicine there come a vast number of cases to which, after careful search, there can be assigned no actual organic cause. To the physician whose interest is particularly student care, these cases come, I believe, with uncommon frequency and their incidence is certainly on the increase. And finally, to the physician whose particular task is the care of the medically educated (or partially educated)—that is medical students and student nurses—the problem presents certain intricate and fascinating angles. It is my purpose in this brief paper to discuss some of these as we find them in the office of personnel care of the Cincinnati General Hospital, the College of Medicine of the University of Cincinnati, and the University School of Nursing.

The disabilities which come into the scope of this discussion are widely varied and range in importance from the most inconsequential of anxiety symptoms to the major psychoses. I feel that it is altogether proper that we consider this subject from the viewpoint of the internist since it is to us as internists that the patients come and it is obvious that by us the great majority of the cases

must be treated. It is further true that even in those cases in which organic disease is definitely present, the patient's reaction to his disease, his capacity to tolerate and to understand his illness, is a major factor in determining morbidity and future good health. To pursue this point a trifle further before turning to the completely functional side of the picture, I am certain that all of you recall, through personal experience, cases of, for example, peptic ulcer, ulcer definitely determined by roentgenogram in an individual being studied for the cause of a digestive complaint, who after adequate care as determined by evidence of ulcer healing, still continued to have unremitting digestive tract complaint—modified perhaps to some degree in type—but none the less persistent. In such an individual it is altogether likely that the fortuitously discovered ulcer was, at best, only partially responsible for the patient's complaints and, representing an expression of the patient's anxiety or tension, failed, in its healing, to bring complete relief, since the tension and anxiety remain to bedevil the patient and his digestive tract as well. Other similar examples are easily discovered and always should be recalled to warn us that the finding of a lesion and the diagnosis of a complaint do not, of necessity, go hand in hand.

Returning now to the purely functional problems, it

*Presented at the Annual Meeting of the American Student Health Association, March 15-16, 1944, Cincinnati, Ohio.

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seems helpful to classify the complaints in several categories which, I am certain, will be all too familiar to you. There is, firstly, the "cardiac" group. These are the patients who suffer from heart awareness. Their complaints include inability to breathe deeply—with the accompanying sighing respirations; cardiac palpitations mostly noted at night; awareness of occasional extra-systoles as an uncomfortable and irregular thump in the chest. The group complaining of vague chest pain may be well placed here. Tachycardia without organic basis is, of course, exceedingly common and proves particularly troublesome after some outside source, such as the Army or an insurance physician, has pointed out its existence and has, perhaps, laid some stress or importance to it. Certain cardiovascular "fears" are commonly found among medical students—chiefly fear of hypertension which turns every headache into a catastrophe and fear of coronary disease which converts the heartburn of dyspepsia into, so the student is firmly convinced, inverted T waves.

Still a larger group is made up of those whose problems center about the digestive tract. A paper in itself could be written about student constipation and, more particularly, about their reactions to it. It has been often written before, but it is none the less true, that advertising and folk-lore have made such a fetish of the daily movement that even among those who should know better a two-day deficit frequently approaches a calamity which the physician is called upon to avert by blasting. The nursing students are particularly problems in this respect and are surprisingly ill-educated, it seems to me, in the efficacy of routine and the usual physiologic adequacy of the colon.

Abdominal pain is an important item. This may be epigastric—simulating ulcer in its response to food and medication—but showing no actual ulcer on careful and repeated study, or it may, and this is certainly more common, be diffuse, primarily peri-umbilical and accompanied by sensations of distention and bloating. These symptoms, which are immediately the result of disturbances in the tone, motility and, perhaps, secretion of the bowel, are ultimately expressions of anxiety and tension and can be treated with satisfaction only when the therapeutic approach takes cognizance of this fact. Nausea is, I think, a symptom but little understood. Its frequency as a purely functional symptom is so great that I feel sure that each of you has experienced it, as certainly I have, on occasion. There is not a class of incoming nurses in which one or more of the girls does not find her way to the office on the second or third day with the nausea (and frequently emesis) of homesickness—such a socially acceptable demonstration of presumably organic illness being preferred by the patient's ego to the rank admission to herself and others that she is unhappy in her choice and wishes to return home. Pre- and post-examination nausea are also commonly encountered. Many nausea problems, however, are much less simple and require a careful and time-consuming working out. There are other common complaints of a functional nature; bloating, belching—usually on the well known basis of aerophagia—flatulence, etc., which

are commonly encountered in this type of student practice and which I shall do no more than mention.

It is not my purpose in this brief communication to list all the various neurotic pitfalls into which the susceptible may stumble but I feel it proper none the less to dwell a moment at this point on that particular problem which faces me as a physician for medical students. This is, of course, the imitative medical student's disease, and the reason why I wish to stress this will later be apparent. Is there one of you physicians who cannot hark back to the formative phase of your career and fail to recall the judicious manner in which you compared the symptoms in the book or the descriptions of the clinical lecture with real or, perhaps more often, imaginary complaints of your own? I know, speaking personally once again, that in this particular respect I was as guilty as most and, indeed, more so than many. The fact that this mental mechanism is almost universally wide spread places it of course in the group of normals except as it may be made abnormal by over-emphasis, undue anxiety, unreasoning fears, or be made a convenient symptom of a pre-existing complex. Perhaps a single example here will serve to illustrate the usual reaction of the student as we see it.

In the second year a lecture is given as a clinical correlation to the course in pathology by a member of the surgical staff. This lecture deals with tumors of the skin and a fair portion of it apparently with the entity of malignant melanomata. The date of this lecture is obviously not known to me; but with the regularity of the seasons, with the inevitability of the income tax, a day will arrive when the office waiting room will hold from three to ten of the men all craving molectomies. It is then I know that the melanoma lecture has occurred and the open season on pigmented naevi is declared officially on. The point of interest in this trivial affair is the unavailing use of teleologic reason in the matter. It is useless to point out that the statistical incidence of deaths from malignant melanomata is very small indeed and that the chances of dying of cardiovascular renal disease overshadow all other probabilities. Furthermore, it is quite common for the student to have fifty moles—more or less promiscuously scattered about his corporeal being—and to fixate his anxiety on one or two, no blacker, nor larger, nor any more subject to irritation than a dozen others. Remove the two in question, the gesture of safety has been made; and the matter is allowed to cool and drop. The interesting part of this entire matter to us, assuming, of course, that every member of the class is afflicted with at least a few naevi, is that it serves to winnow out for us our group of potential neurotic problems. It has been instructive to see how often it is the men who had molectomies in the second year, who have troublesome anxiety manifestations in the third.

Whether or not such an ephemeral thing as the psychoneurotic tendency in a group is static or changing in amount is a dangerous thing to state. I am well aware of the pitfalls that lie in wait before the unsupported clinical impression. With this bow, then, in the direction of discretion, let me aver that, in my opinion at least,

these manifestations have in the past year become more frequent and more severe. Indeed why should this not be so? The replacement of the leisurely five to seven or eight year medical training by a total educational career of approximately fifty months imposes on the student not only a profound strain of study but also increases whatever sensations of insecurity he may already have. He realizes the inadequacy of his training, no matter how desperately he may strive, compared to his predecessors and realizes also that the possibilities of his renewing his education on his return from military service are clouded and uncertain. In addition to this another sword is constantly suspended above his head. That is the eventuality of unsatisfactory work. To know that a failed examination may bring immediate active infantry service instead of several years devoted to the learning of a gainful lifetime career, particularly under the advantageous financial arrangements now in effect, is a profoundly trying situation. Inadequate sleep, careless nutrition, and the generally keyed-up uncertainties of wartime living may be also mentioned as accessory but rather important points favoring the development of anxiety and insecurity states with their accompanying somatic symptoms.

Among the nursing group, particularly the cadets, a somewhat similar situation prevails although the "speed-up" is not so drastic nor is the effect of failure so profound. In both groups the usual sexual problems are modified and their emotional tone heightened by the knowledge of enforced brevity of any attachment. It is this feeling of need for haste combined with a desire for the security sensation offered by an allegedly "permanent" attachment which has pushed some of the student group into unwise situations from which the only ego-acceptable retreat has been neurotic ill-health. Symptoms in such cases have varied from the relatively ordinary manifestations described in the first portion of the paper to actual major hysterical phenomena.

It now remains to consider what we, those charged

with the well being—both physical and mental—of such student groups, can do to prevent or ameliorate such situations as I have been describing. It is proper to admit at once that certain causal factors cannot be controlled. There will always be a percentage of unstable individuals in the group who will certainly slip into the neuroses. There will be a small additional number who will be pushed into them by the unusual stresses I have just outlined. These stresses are beyond our power to modify and will therefore continue, for the present at least, to act. There is, however, a suggestion I would like to make as to a method of aborting the phenomena of the functional illnesses early and, perhaps in some instances, to scotch their development entirely.

Recognizing the deeply ingrained tendency of the student to attempt to clothe himself with each group of symptoms demonstrated to him, it seems likely that if, at an early stage of professional training, several periods were set aside specifically to educate in the characteristic manifestations of neuroses, such as were discussed in the opening phase of this paper, the student would, through introspection, come to recognize himself. He would, hearing of the nature of the functional diseases, search himself for the symptoms of them. If there be any truth in argument by analogy, you may be certain that if he should so search, he would most certainly find. Too, if later in his career he be beset by hypochondriasis in any of its forms, his pre-existing knowledge of the subject—not of the simulated organic disease itself—but rather of the entity of hypochondriacal psychoneurosis, will serve as a powerful aid to the attending physician. Argument before the event occurs is the point I wish to stress.

Finally let me urge that the functional entities be kept always in the forefront of our consciousness. In this way only will the recognition of non-organic disease become a positive one rather than, as I am afraid is now so often the case, a sheer matter of elimination.

Health Education by the Doctor*

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WHEN the doctor practiced in a simpler community he was automatically the leader in health education among his patients. When they wanted to know something about their health they turned instinctively to the family doctor. As our civilization progressed toward complexity—and not infrequently confusion—these simple relationships were disturbed. The doctor is now trying to resume his natural place as leader in health education by acting in his corporate capacity rather than as an individual. The doctor still does a tremendous amount of health education in connection with and as a part of his practice. The amount

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of this and its effectiveness can probably never be measured. In addition, however, the doctor through medical organization furnishes health information to the community at large, including his own patients.

The American Medical Association recognized the importance of health education when it created a Council on Health and Public Instruction in 1911. This council functioned until 1923, when it became a bureau. The name of this bureau was changed in 1938 to Bureau of Health Education. The secretaries of the council were Dr. Frederick Green and Dr. Victor C. Vaughan; the directors of the bureau have included Dr. Olin West, Dr. John M. Dodson, and the present incumbent, your speaker.

The Bureau of Health Education functions through two main channels; one direct to the public and one to the public through the medical profession. Direct contacts with the public include an extensive question and answer correspondence, network and local radio broadcasting, lectures, and numerous liaison arrangements with non-medical civic and professional organizations. Health education through the medical profession is accomplished by furnishing materials and assistance in local programs of health education carried out by local, including state, medical societies.

The Bureau of Health Education is closely associated with *Hygeia*. *Hygeia* is the only nationwide health publication which is directly sponsored by the medical profession. Its leadership in its field is unchallenged. Strangely enough, *Hygeia* is valued everywhere outside the medical profession more than it is within. Doctors give two main reasons for lack of enthusiasm about *Hygeia*. The first reason is that *Hygeia* tells patients too much and thus stimulates them to attempt to treat themselves, with disastrous results to the patient and frequently unnecessary annoyance to the doctor, who has to undo the harm done by over-enthusiastic self-diagnosis and self-treatment. The other most common criticism is precisely the reverse, namely that *Hygeia* does not tell patients enough to satisfy them. We do not believe that either of these reasons is valid. We have more sympathy with the doctor who said he would not put *Hygeia* into his waiting room because patients stole it as fast as he can put it out. We consider this situation admirable; the remedy is reserve copies of *Hygeia* to be put out as fast as they are stolen. There is no better contribution which the doctor can make to health education in the community, and incidentally to the building-up of proper understanding by his patients of the doctor and his colleagues. We believe that every doctor should have *Hygeia* on his waiting room table.

The "Question and Answer" department in *Hygeia* is edited in the bureau of health education, but the questions and answers you see represent less than one per cent of those received and answered. Stimulated by *Hygeia* itself, by radio broadcasts, by suggestions from doctors to their patients, and by the listing of the American Medical Association in school and college bibliographies, by newspaper publicity and by word of mouth, question letters pour into the headquarters of the American Medical Association.

There are three lines of radio communication to the public. First is the dramatized network program currently running under the title "Doctors at War" and previously broadcast under other titles, including "Doctors at Work," "Medicine in the News," "Your Health." This is in cooperation with the National Broadcasting Company and is regularly broadcast over 60 to 80 stations, border-to-border and coast-to-coast. The time and a considerable contribution to the production costs are donated by the National Broadcasting Company. Other radio broadcasting is arranged in cooperation with all networks and local stations whenever and wherever the American Medical Association meets and your speaker

frequently includes radio talks as a part of his travel itinerary. Broadcasts have also been arranged in connection with the annual scientific meetings of medical specialists' societies. A second line of radio communication is by means of materials furnished in script form for local broadcasting by state and county medical societies, or assistance to such societies in planning and carrying out their radio broadcasting. A third line now developing and showing considerable promise is electrically transcribed radio programs ready for broadcasting with a minimum of local participation. These electrically transcribed programs are loaned to state and county medical societies or local organizations on approval of the medical society. There is no charge for them except return transportation. A fourth line involving radio is also by electrical transcription but specifically to schools. The bureau has a set of records entitled "Health Heroes," consisting of simple stories with a health lesson which can be broadcast by radio stations or can be played in schools having appropriate equipment, which many schools now have. This latter set of records is for sale, not for loan; prices may be had on application.

The director of the bureau travels as much as he can to make local addresses, preferring statewide organizations such as medical societies, education associations, parent-teacher associations, women's clubs or large and significant local groups. He addresses many high school assemblies, considering them the most important audience because of their receptiveness and because high school students will be in charge of the destinies of our nation in the very near future.

The question and answer correspondence is carried largely by the assistant director of the bureau, who devotes his entire time to it. These letters are of importance not only because they contribute to health education but they enable us to know what the public is thinking about health and thus this correspondence affords a valuable guide to the action of the bureau from time to time.

A further important activity is the development of cooperative relationships with and service to other organizations. Each year the bureau serves in one way or another departments of the Federal government, the Armed Forces of the United States, state and local health departments, educational institutions and school systems, and such lay organizations as the National Congress of Parents and Teachers, the General Federation of Women's Clubs, the American Society for the Control of Cancer, the National Tuberculosis Association, the National Safety Council, the American Camping Association, the National Organization for Public Health Nursing, and many other groups. The director of the bureau has been both chairman and secretary of the section on health education of the American Public Health Association, has served on important committees of the association and is currently an elective member of its governing council. The director is a member, and was until recently secretary, of the joint committee on health problems in education of the National Education Association and the American Medical Association, which

committee yields a large influence in the solution of health problems in education. The director also served as one of twelve members of the commission appointed by the American Association of School Administrators to prepare its yearbook *Health in Schools*. This yearbook, together with the joint committee's volume entitled *Health Education*, furnish to school administrators, supervisors and teachers, an interpretation of health education and school health policies which has gone far to stimulate progress and develop unity in the health education programs throughout the nation, as well as to interpret to the administrators the viewpoint of physi-

cians and to doctors the viewpoint of school administrators.

The bureau of health education is your agency, created to serve you. Its personnel of two doctors and eight stenographers and typists is too small to do more than create materials and make them available for local use and occasionally to appear locally upon invitation. If health education by the medical profession is to be effective it must be done locally. The late Dr. Rock Slyster, president of the American Medical Association, described the headquarters in Chicago as an ammunition factory and the local medical societies as the firing lines.

Specific Types of Alpha Streptococci and Streptococcal Precipitinogen in Air in Relation to Epidemic Infections of the Respiratory Tract and Nervous System

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IN previous studies by the use of special methods and procedures¹⁻¹¹ it has been shown that green-producing or alpha streptococci having distinctive virulence and serologic properties are related etiologically to certain nonepidemic and epidemic infections. The underlying reasons responsible for the occurrence and spread of certain epidemic diseases associated with alpha streptococci, often almost simultaneously over vast areas, with little or no evidence of contact infection, and the reasons for their disappearance, are still not fully understood.

The possibility that postoperative infections,^{12,13} which occur despite the most rigid technical precautions, may sometimes be air-borne was shown when streptococci, identical with those causing the infection, were isolated from the air of operating rooms in 1904¹⁴ and during the pandemic of influenza in 1918. Knowledge of the importance of air-borne infection has been extended greatly by recent epidemiologic^{12,15} and quantitative bacteriologic studies, especially those of Wells and his associates.^{16,18}

On the basis of my experiences, it was thought that perhaps the highly favorable methods developed during studies on specificity of streptococci might suffice for the isolation of specific types of alpha streptococci from air and for the demonstration of corresponding precipitinogen in air during epidemic respiratory and other infections and thus, perhaps, these methods might make more explicable the reasons for the occurrence, spread and disappearance of such infections. A short preliminary report of results obtained was made in 1939.¹⁹

It is the purpose of this paper to describe the methods used and to report the results obtained in bacteriologic studies of indoor and outdoor air made, as opportunity was afforded, chiefly during the course of epidemic and nonepidemic periods from August, 1938, to June, 1943.

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METHODS

Various methods were used for procuring samplings of air for study. At first, parallel exposures of blood agar plates and liquid mediums were made but since streptococci were rarely obtained on blood agar and those that grew proved nonvirulent, use of this medium for primary isolations was discontinued. It became the routine to expose to air dextrose-brain broth and chick-embryo medium (the mediums found especially favorable in previous studies for the primary isolation of highly sensitive, specific types of alpha streptococci), dextrose broth and distilled water.

Dextrose-brain broth consisted of 0.2 per cent ordinary dextrose broth adjusted to pH 7.2, to which approximately one part of pieces of freshly obtained calf brain to six or seven parts of broth in tall (10 cm.) columns was added before autoclaving.

The chick-embryo medium consisted of the contents and shells of nineteen-day hatching chicken eggs passed through a meat chopper (1 part) and distilled water (7 parts). The medium was placed in tall columns in tubes and bottles and, after autoclaving, was layered with 2 cm. of sterile liquid petrolatum.

Exposures were made (1) by bubbling air through tall columns in test tubes (6 inches by $\frac{1}{8}$ inch [15 by 1.6 cm.]) of autoclaved chick-embryo medium, dextrose broth and water and, to prevent loss of medium from foaming, through 200 cc. of dextrose-brain broth in liter flasks; (2) by exposing to indoor air for from eight to twenty-four hours ten to twelve tall test tubes containing these mediums and water, with cotton plugs removed, and large surfaces of these mediums and water in Petri dishes or plates and then transferring the mediums from the Petri dishes or plates to test tubes for incubation and using the water, after it had been made isotonic, for precipitation tests; (3) by exposing to outdoor air these

mediums and water contained in bottles (2.7 by 5 cm.) having an opening 1.6 cm. in diameter screened with 16 mesh cloth, tilted forward to an angle of 60 degrees on the hood of the automobile during drives for mobile samplings (fig. 1) and on weather vanes for stationary samplings; (4) by exposing oiled spun glass contained in tubes with open ends, horizontally placed on the hood of an automobile (fig. 1) or on weather vanes. In the first method the air was drawn through the mediums by means of an electrically driven suction pump for indoor air and by tapping the vacuum line of the automobile engine for stationary and mobile samplings of outdoor air.

Bundles of three test tubes (6 inches by $\frac{1}{8}$ inch [15 by 1.6 cm.]) containing the oiled spun glass or fiber-glass were exposed routinely on weather vanes and bundles of seven tubes in specially designed holders were exposed to outdoor air at the top of opposite vestibule doors at the unworked end of Pullman cars of moving trains. During airplane flights at the time of, and remote from epidemics many similar tubes containing oiled spun glass were exposed on different parts of airplanes protected against contamination from persons in the plane. To make certain that the samplings represented air at high altitude, some of the holders were fitted with shutters, which were opened at high altitudes. After exposure of the tubes to the air the shutter was closed before the plane descended. The bundles of open screened test tubes containing the spun glass had been wrapped in paper towels and then autoclaved and were placed on the weather vanes or into the holders under sterile precautions. After exposure they were wrapped in sterile paper towels and were brought or shipped to the laboratory by air mail or express.

Cultures were made by planting the front and back one-third portions of the exposed spun glass from each tube into dextrose-brain broth and dextrose-brain agar. To avoid possible contamination this procedure was done in a nonstacked bacteriologic hood. The middle third portion was washed off by thorough shaking with 3 cc. of saline solution, 1 cc. of which was inoculated into dextrose-brain broth and 2 cc. was centrifuged clear for precipitation tests.

Exposures of the various materials, with sterile precautions, were made under conditions that commonly prevail as air is respired by human beings and animals, and, in contrast, under conditions as remote as possible from sources of contamination of air. Comparable stationary exposures to air were made at ground level and at the top and 10 feet (3 meters) out from the side of a tall building sixteen stories from the ground. Comparable stationary and mobile samplings were made during and after epidemics and simultaneously within and outside epidemic zones. Exposures during mobile samplings were made on the hood of an automobile during drives of 20 to 700 miles (32 to 1,100 kilometers) or more in special instances, but usually during drives of 200 to 300 miles (320 to 480 kilometers). Subcultures in dextrose-brain agar often were made, meanwhile, from exposed dextrose-brain broth at intervals of 50 miles (80 kilom-

eters). In stationary samplings, the time of exposure varied from one to forty-eight hours but usually ranged from twelve to twenty-four hours.

Exposures to indoor air were made in eight different states in hospital rooms or wards occupied by persons ill with the respective epidemic diseases or by well persons remote from epidemics and in unoccupied rooms. Exposures to outdoor air were made on weather vanes during and remote from epidemics, on an automobile during drives totaling approximately 35,000 miles (56,000 kilometers) and on moving trains (8,500 miles [13,700 kilometers]) or airplanes (6,500 miles [10,500 kilometers]) in altogether twenty-eight states and one province of Canada.

Information as to the presence or absence of epidemics in the different localities was obtained on personal inquiry en route and from physicians, health officers and superintendents of schools. Exposures to outdoor air were made at all seasons of the year under a very wide range of conditions as regards humidity, temperature and sunshine. They were made over bodies of water far from land or ships with the wind blowing toward shore, during hot dry weather in summer and over some of the same routes after heavy rains, in forests and on mountain tops, in temperate and subtropical zones, in midwinter during subzero weather when vast areas of countryside were covered with snow, during first rains after long dry spells and soon after second rains, and in snow storms and fog.

Cultures from rain collected in open Petri dishes or in bottles fitted with funnels and from freshly fallen snow collected in a sterile manner and then melted, were made by inoculating 30 cc. of each into 180 cc. of dextrose-brain broth in tall 8 ounce (240 cc.) bottles and 2 cc. into each of ten to fourteen tubes of dextrose-brain broth. Part of each specimen of rain and melted snow was saved for the precipitation test.

The tubes and bottles of culture medium, after exposure to air, and the cultures from the exposed fiberglass and from rain and snow were incubated at 33 to 35° C. for eighteen hours, or until evidence of growth appeared. Films were made of the centrifuged sediment of the exposed water and washings in saline solution of exposed

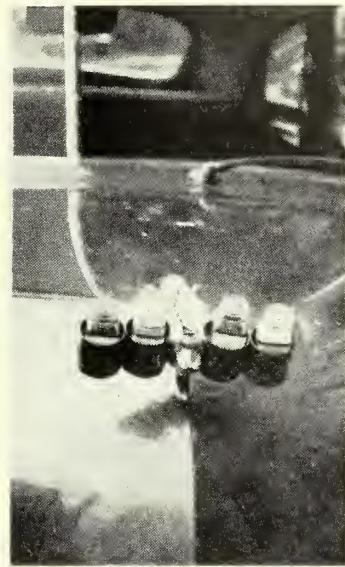


Fig. 1. Assembly illustrating two methods used on the front of an automobile to obtain samplings of air. The screened bottles contained culture medium and water and the screened tubes contained oiled fiberglass ($\times 1/6$).

fiberglass and of the exposed and incubated dextrose-brain broth, chick-embryo medium and dextrose broth. The films were stained by the Gram-safranine method, after which they were examined and types of organisms present were recorded.

For determining the types of streptococci, streak cultures were made on blood-agar plates of cultures showing streptococci in films. However, for inoculation of animals and for agglutination tests pure cultures of the streptococci were obtained from the endpoint of growth in serial dilution cultures⁵ made alternately in dextrose-brain broth and dextrose-brain agar from mixed cultures of streptococci and other organisms.

The morphologic characteristics, staining reactions, serologic properties and character of growth of the streptococci in dextrose-brain broth and other mediums and on blood-agar and their effects on animals after various methods of inoculation were studied. The fermentative reactions were not studied routinely since they do not bear any relation to the more fundamental qualities of virulence and serologic reactions.

Rabbits and guinea-pigs were inoculated intracerebrally routinely with 0.1 cc. of 1:200 to 1:10,000 dilutions of young (four to eighteen hours) dextrose-brain broth cultures of the streptococci as soon as possible after isolation. Mice were inoculated intraperitoneally with 1.2 cc. and intranasally with 0.05 cc. of the undiluted cultures and intracerebrally with 0.03 cc. of the 1:200 to 1:10,000 dilutions. To determine their invasive power and epidemiologic significance, pure cultures of the streptococci from outdoor air were nebulized into the air of cages in which mice were kept. The animals were observed twice daily and necropsies were performed as soon as possible after their death.

Macacus rhesus monkeys were inoculated intracerebrally with 2 to 3 cc. of cultures from air in dextrose-brain broth, dextrose broth and chick-embryo medium, which showed streptococci after incubation for twenty-four hours; with filtrates of chick-embryo medium cultures containing streptococci in mixture with other bacteria or in pure culture, after incubation for from three to twenty-one days; and with 5 per cent emulsions and filtrates of emulsions of brain and spinal cord of animals that had succumbed to inoculation with cultures or filtrates. Sometimes, 1 or 2 cc. was inoculated intraspinally also and larger amounts of the cultures, filtrates and emulsions often were inoculated intraperitoneally also. In instances in which symptoms did not follow, or in which they were slight, the inoculations were repeated at short or long intervals.

For agglutination tests, young, pure cultures of streptococci in dextrose-brain broth from the endpoint of growth in serial dilution cultures were centrifuged and the streptococci were suspended in dense suspension (200 to 1) of glycerin (2 parts) and saturated solution of sodium chloride (1 part). These suspensions were diluted with saline solution containing 0.2 per cent phenol to twice the density of a dextrose-brain broth culture, or 4,000,000,000 organisms per cubic centimeter. Two-tenths cubic centimeter of the respective suspensions was

mixed with 0.2 cc. of fivefold (1:10 to 1:1,250 or tenfold (1:20 to 1:2,000) dilutions of the respective anti-streptococcal serums and the setups were incubated at 50° C. for eighteen hours, after which readings were made.

For the interphase precipitation test, water that was exposed to air and water from first rains or from melted snow was brought to isotonicity by adding 25 per cent solution of sodium chloride (1 part) to the water (30 parts). The precipitation tests were made in small tubes by layering the cleared, undiluted water, tenfold dilutions of the water and 1:10, 1:100 and 1:1,000 dilutions of saline solution washings of filter dusts, over the respective antisera prepared in horses in parallel manner with streptococci freshly isolated from patients ill with the respective diseases. The antibody titers of the serums for the respective strains were similar. The specificity of the streptococci used for immunization of horses was preserved throughout the period of immunization (one to two years) in the glycerin-saline solution menstruum. Appropriate dilutions of these dense suspensions were made as needed for injection of horses.

RESULTS OF CULTURES

Gram-positive bacilli of the *bacillus subtilis* group nearly always grew in all mediums after exposure to outdoor air and in winter were often the only organisms obtained. Gram-negative, gas-producing bacilli (*aerobacter aerogenes* or *Escherichia coli*) and micrococci grew next most often after exposure to outdoor air and these, with gram-positive bacilli, grew after exposure to indoor air. The incidence of isolation of gram-positive or gram-negative bacilli and micrococci from indoor or outdoor air did not bear any relation to the presence or absence of epidemic respiratory and other infections. Gram-positive, spore-bearing bacilli resembling *Clostridium tetani* sometimes grew in dextrose-brain broth and chick-embryo medium, but never in dextrose broth, after exposure of these culture mediums to outdoor air. The incidence of isolation of micrococci was highest when blood-agar plates were exposed to air. Thus, colonies of micrococci grew in 85 per cent and streptococci grew in only 13 per cent of sixty-six exposures, in contrast to micrococci in 48 per cent and streptococci in 60 per cent of 194 exposures of dextrose-brain broth to indoor air. Streptococci almost never were obtained on solid mediums, such as blood-agar plates, exposed to outdoor air and those that did grow usually were nonvirulent.

A fairly characteristic, usually gram-negative diplo-streptococcus which, from as yet unpublished studies, has been incriminated as the probable etiologic agent in epidemic infectious gastro-enteritis was isolated frequently from indoor and outdoor air during epidemics of this disease, usually in mixture with alpha streptococci.

When dextrose broth, dextrose-brain broth and chick-embryo medium were exposed to air in parallel manner, the incidence of isolation of streptococci in dextrose broth was about a third to a half as great as in dextrose-brain broth and chick-embryo medium. Growth of micrococci in pure culture often occurred in dextrose broth when the other mediums yielded streptococci in pure form or in

mixture with micrococci. Moreover, the streptococci that grew in dextrose broth, especially those from outdoor air, usually were nonvirulent or not specifically virulent for animals and were not suitable for agglutination tests.

The morphologic characteristics, size, grouping, chain-formation and staining reactions of the streptococci isolated during and remote from epidemics, while variable, were not sufficiently distinctive for differentiation. The streptococci were gram-positive and nearly all strains produced green (alpha type) or indifferent colonies on blood-agar plates. Distinctive properties of the streptococci and diplostreptococci isolated in our special media became apparent only on inoculation of animals and from agglutination and precipitation tests with the respective highly specific antistreptococcal serums.

The incidence of primary isolations of streptococci and gram-positive or gram-negative diplostreptococci was by far the greatest in dextrose-brain broth and chick-embryo medium and was so nearly alike in these media that only the total incidence of their isolation was summarized. The number of samplings cultured and the incidence of isolations, according to season, are shown in table 1. There was no great difference in the incidence of isolations of streptococci from indoor air during autumn, winter, spring and summer. The incidence of isolation of streptococci from outdoor air was higher than from indoor air during autumn and nearly as high during spring and summer but was far less during winter. This was especially true after the countryside was covered with snow. Isolation of the diplostreptococcus was significantly higher from indoor and outdoor air during autumn than during winter, spring or summer.

Sixty-seven per cent of a total of 819 exposures to indoor air cultured in dextrose-brain broth and chick-embryo medium during the different seasons yielded streptococci and 18 per cent yielded the diplostreptococcus. Sixty-one per cent of 1,089 exposures to outdoor air cultured in these media yielded streptococci and 19 per cent yielded the diplostreptococcus.

The results of cultures from indoor and outdoor air in relation to epidemic respiratory and other infections are summarized in table 2. The number of exposures summarized in table 2 is somewhat less than the total shown in table 1 because, in some instances, information obtainable regarding the prevalence or not, and type, of epidemic diseases at the time exposures were made was insufficient to permit classification. It will be seen (1) that, with one exception, the incidence of isolations of streptococci was higher from exposures to indoor and outdoor air in relation to the different epidemic respiratory and other infections than from exposures made remote from epidemics; (2) that isolations of streptococci from outdoor air averaged nearly as high as from indoor air; (3) that isolations of streptococci from outdoor air were relatively low during epidemics of respiratory and gastro-intestinal infections, which occurred chiefly in winter, and (4) that isolations of the diplostreptococcus from indoor and outdoor air were especially high in relation to epidemic infectious gastroenteritis.

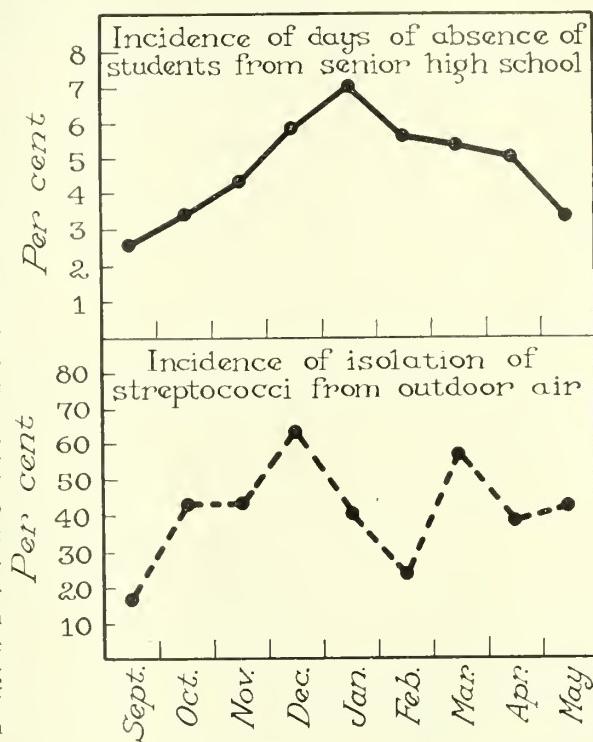


Fig. 2. Percentage incidence of days of absence of students from senior high school and of isolations of alpha streptococci from outdoor air, September, 1942, through May, 1943.

As shown in figure 2, with the exception of January and February, there was close agreement between the incidence of isolation of streptococci from outdoor air and the incidence of days of absence of students, due chiefly to epidemic infections of the respiratory tract, throughout nine months of school. The relatively low incidence of isolation of streptococci from outdoor air during January and February, when the ground was covered with snow, is in keeping with the low incidence of their isolation from outdoor air during winter, shown in table 1.

RESULTS OF EXPERIMENTS ON ANIMALS

The results obtained in rabbits after intracerebral inoculation of the streptococci and diplostreptococci isolated from indoor air are summarized in table 3. The mortality rate was consistently much higher after inoculation of the streptococci isolated from exposures to air of rooms occupied by persons having epidemic respiratory or other infections than after inoculation of streptococci from air of occupied rooms remote from these infections. The incidence of tremors and muscular spasms, including spasms of the diaphragm, was high in the animals inoculated with the streptococci isolated from exposures to indoor air in the presence of cases of encephalitis among horses¹⁰ and human beings and of cases of epidemic or postoperative hiccup in contrast to the incidence of these signs after inoculation of streptococci isolated from indoor air remote from epidemics.

The occurrence of diarrhea and, in the case of rabbits that died, the presence of lesions of stomach or intestines

TABLE 1
Incidence of isolation of streptococci and diplostreptococci from air according to season

Seasons: 1938 to 1943	Dextrose-brain broth and chick-embryo medium exposed to									
	Indoor air					Outdoor air				
	Samplings	Streptococci		Diplostreptococci		Samplings	Streptococci		Diplostreptococci	
		Number	Per cent	Number	Per cent		Number	Per cent	Number	Per cent
Autumn	157	83	53	58	37	388	270	70	117	30
Winter	285	193	68	34	12	221	73	33	30	14
Spring	198	137	69	31	16	146	94	64	7	5
Summer	179	134	75	21	12	334	224	67	51	15
Total	819	547	67	144	18	1,089	661	61	205	19

TABLE 2
Incidence of isolation of streptococci and diplostreptococci from air in relation to epidemic respiratory and other infections

Samplings in relation to	Dextrose-brain broth and chick-embryo medium exposed to										
	Indoor air					Outdoor air					
	Exposures	Per cent yielding		Exposures	Per cent yielding		Exposures	Per cent yielding		Exposures	
		Strepto-	cocci		Diplostrept-	cocci		Strepto-	cocci		Diplostrept-	cocci
Influenza and related infections	Respiratory	210	75	24	149	53	12				
	Gastro-intestinal	28	54	14	27	55	22				
Infectious gastro-enteritis		43	51	56	64	61	73				
Persistent epidemic and postoperative hiccup		24	88	17	66	61	11				
Encephalitis in human beings		94	77	7	189	79	10				
Equine encephalitis		36	75	31	48	65	38				
Poliomyelitis		140	78	16	154	62	12				
Controls, remote from epidemics		170	51	8	234	49	20				
Total		745	69	18	931	61	19				

TABLE 3
Results in rabbits inoculated with streptococci and diplostreptococci from indoor air in relation to epidemic respiratory and other infections

Streptococci from indoor air in relation to cases of	Strains	Results in rabbits inoculated intracerebrally											
		Animals inoculated	Deaths		Per cent of animals having				Per cent of animals that died having lesions in		Cultures from brain		
			Number	Per cent	Tremors	Spasms	Other muscles	Diarrhea	Flaccid paralysis	Stomach or intestines	Lungs	Number	Percent yielding streptococci
Influenza and related infections	Respiratory	101	184	143	78	13	1	5	10	8	9	94	66
	Gastro-intestinal	14	46	40	87	18	0	18	28	7	25	37	36
Infectious gastro-enteritis*		19	105	68	65	4	0	4	39	1	40	10	46
													33
Persistent epidemic and postoperative hiccup		23	66	38	58	59	59	50	3	6	10	61	29
Encephalitis		24	36	24	67	56	19	41	0	8	8	42	36
Poliomyelitis		32	92	56	61	25	1	13	1	58	0	48	62
Control, remote from epidemics		81	148	41	28	6	0	3	1	1	0	24	24

*The streptococci isolated from air in relation to infectious gastro-enteritis usually were gram-negative and in diplococcal formation.

was far greater after inoculation of the gram-negative diplostreptococci from indoor air in relation to cases of epidemic infectious gastro-enteritis and after inoculation of gram-positive diplostreptococci isolated from air of rooms occupied by persons having gastro-intestinal influenza than after inoculation of the gram-negative diplostreptococci isolated from air of rooms occupied by persons having other epidemic diseases. The streptococci in diplococcal formation and which usually were gram-nega-

tive on isolation from air in relation to epidemic infectious gastro-enteritis, and less often in relation to other diseases, became gram-positive and grew in typical streptococcal formation after animal passage.

The incidence of flaccid paralysis was by far the highest after inoculation of streptococci isolated from air of rooms occupied by persons ill with acute poliomyelitis and lesions of lungs (pneumonitis) occurred in highest incidence after inoculation of streptococci from air of

TABLE 4
Results in rabbits inoculated with streptococci and diplostreptococci from outdoor air in relation to epidemic respiratory and other infections

Streptococci from outdoor air in relation to cases of		Strains	Animals inoculated	Results in rabbits inoculated intracerebrally										
				Deaths		Per cent of animals having				Per cent of animals that died having lesions in		Cultures from brain		
				Number	Percent	Tremors	Diaphragm	Other muscles	Diarrhea	Flaccid paralysis	Stomach or intestines	Lungs	Number	Percent yielding streptococci
Influenza and related infections	Respiratory	103	272	156	57	18	1	9	16	10	12	81	171	58
	Gastro-intestinal	14	40	35	88	18	0	18	40	15	51	94	29	62
Infectious gastro-enteritis*		18	80	47	59	9	0	4	26	0	32	11	37	51
Persistent epidemic and postoperative hiccup		37	119	62	52	56	46	45	8	8	6	53	13	69
Encephalitis in human beings		62	114	48	42	71	8	50	7	9	0	38	65	81
Equine encephalitis		21	76	53	70	26	0	18	13	12	19	36	23	41
Poliomyelitis		43	110	51	46	18	4	13	9	45	3	32	40	48
Control, remote from epidemics		108	220	55	25	13	0	11	7	2	4	25	61	42

*The streptococci isolated from air in relation to infectious gastro-enteritis usually were gram-negative and in diplococcal formation.

TABLE 5
Results after inoculation of mice with streptococci isolated from indoor and outdoor air in relation to epidemic respiratory and other infections

Source of streptococci: air in relation to	Inoculation	Strains	Animals inoculated	Results in mice							
				Deaths		Per cent of animals showing lesions of		Cultures			
				Number	Percent	Pleura	Lung	Brain	Blood	Number	Percent yielding streptococci
Influenza	Intracerebral	48	196	95	48	0	12	90	68		
	Intraperitoneal	153	336	184	55	50	13			213	74
	Intranasal	58	138	40	29	0	52			75	36
Infectious gastro-enteritis	Intracerebral	36	77	65	84	0	0	41	51		
	Intraperitoneal	17	32	20	63	22	0			6	17
Encephalitis	Intracerebral	47	245	105	43	0	4	145	33		
	Intraperitoneal	43	142	97	68	18	3			34	50
Poliomyelitis	Intracerebral	24	98	48	49	0	0	37	89		
	Intraperitoneal	22	45	22	49	0	0	7	57	7	57
	Intranasal	6	42	9	21	0	0	9	67	9	67
Control, remote from epidemics	Intracerebral	48	119	28	24	0	0	27	33		
	Intraperitoneal	60	113	30	27	7	0			42	33
	Intranasal	8	61	11	18	8	0	0	0		

TABLE 6
Results in mice caused to respire streptococci isolated from outdoor air in relation to epidemic respiratory and other infections

Epidemics during which streptococci were isolated from outdoor air	Material nebulized into cages in which the mice were kept	Duration of experiment when mice were anesthetized	Mice	Incidence of isolation of streptococci from					
				Brain		Lungs		Blood	
				Number	Percent	Number	Percent	Number	Percent
Influenza	Chick-embryo culture of streptococci	2 days	36	11	31	25	69	9	25
	Sterile chick-embryo medium	2 days	36	1	3	4	11	0	0
Equine encephalo-myelitis	Dextrose-brain broth culture of streptococci	1 hour	32	22	69	32	100	14	44
	Sterile dextrose-brain broth	1 hour	32	0	0	9	28	1	3
Encephalitis	Dextrose-brain broth cultures of streptococci	2 days	10	4	40	5	50	5	50
	Sterile dextrose-brain broth	2 days	10	0	0	2	20	0	0
Poliomyelitis	Dextrose-brain broth culture of streptococci	3 days	45	7	46	14	31	4	9
	Sterile dextrose-brain broth	3 days	45	1	2	10	22	0	0
Total	Test mice		133	44	36	76	62	32	26
	Control mice		133	2	2	25	20	1	1

TABLE 7
Results in monkeys after inoculation of streptococci obtained from air in relation to epidemic poliomyelitis and encephalitis

Material inoculated	Streptococci from air in relation to epidemics of	Strains inoculated	Inoculations	Percentage incidence of development of				
				Ataxia	Tremors	Spasms	Lethargy	Paralysis
Dextrose-brain broth or chick-embryo medium cultures of streptococci	Poliomyelitis	26	42	12	21	17	5	29
	Encephalitis	7	18	11	50	39	17	11
Filtrates of chick-embryo medium cultures of streptococci	Poliomyelitis	17	41	5	5	5	0	12
	Encephalitis	5	15	13	20	20	13	0
Emulsions or filtrates of emulsions of brain and spinal cord of inoculated animals	Poliomyelitis	25	42	10	26	10	2	36
	Encephalitis	11	20	25	25	25	20	5

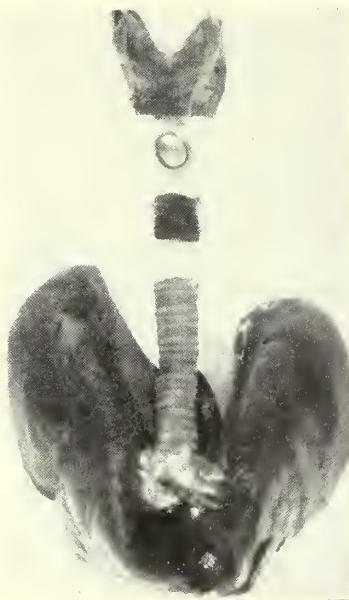


Fig. 3. Hemorrhagic edema of lungs, beginning bronchopneumonia and severe congestion of the mucous membrane of the trachea and larynx of a rabbit that had died forty-eight hours after intracerebral inoculation of streptococci isolated from the air of a room occupied by a person having acute epidemic influenza ($\times 1/2$).

than after inoculation of the streptococci from control exposures to air remote from epidemics. Likewise, the incidence of diarrhea and lesions of stomach and intestines was far greater after inoculation of the gram-negative diplostreptococcus isolated from outdoor air during epidemics of infectious gastro-enteritis than after inoculation of diplostreptococci isolated during other epidemics and remote from epidemics. Isolations of streptococci from the brains of animals that had died, while variable, were uniformly high. The mortality rate usually was somewhat higher among animals after inoculation of streptococci from indoor air (table 3) than after inoculation of streptococci isolated from outdoor air (table 4) during epidemic respiratory and other infections. Thus, 369 (70 per cent) of 529 rabbits died after inoculation with streptococci from indoor air in relation to cases of infectious diseases and 452 (56 per cent) of 811 rabbits died after inoculation with streptococci from outdoor air in relation to cases of infectious diseases.

rooms occupied by persons ill with infections of the respiratory tract.

The incidence of isolation of streptococci from the brains of animals that died was uniformly high.

The results after intracerebral inoculation of rabbits with the streptococci from outdoor air are summarized in table 4. The mortality rate and incidence of respective characteristic symptoms and lesions uniformly were much higher after inoculation of streptococci obtained from air during epidemic respiratory and other infections

The results obtained after inoculation of mice with streptococci isolated from indoor and outdoor air in relation to epidemics of influenza, infectious gastro-enteritis, encephalitis and poliomyelitis are summarized in table 5. The mortality rate and the incidence of lesions in pleura or lungs and of isolation of streptococci from brain or blood usually were much higher after intracerebral, intraperitoneal or intranasal inoculation of the streptococci isolated during epidemics than after corresponding inoculations of streptococci isolated remote from epidemics.

In order to determine whether or not the streptococci isolated from outdoor air were capable of invading and localizing electively in tissues or organs of animals and hence whether they were, perhaps, of epidemiologic significance, pure cultures of streptococci and, as controls, the corresponding mediums, were nebulized in parallel manner into the air of cages in which mice were kept. The mice were killed with ether after exposure to airborne streptococci for from one hour to three days and cultures were made in dextrose-brain broth of pipettings from, or pieces of, brain, lungs and blood. The results of such experiments are summarized in table 6. It will be noted (1) that the incidence of isolation of streptococci from lungs, two or three days after exposure, was highest among mice that had respired the streptococci isolated from outdoor air during epidemics of influenza, and (2) that the incidence of isolation of streptococci from the brain was highest uniformly among mice that had respired the streptococcus isolated from outdoor air during epidemics of equine encephalomyelitis and of encephalitis among human beings. The invasiveness of the respiration streptococci isolated from outdoor air during different epidemics was far greater than that of control strains.

Altogether fifty-seven Macacus rhesus monkeys were inoculated with streptococci obtained from indoor and outdoor air in relation to epidemic poliomyelitis, encephalitis and equine encephalomyelitis. Twenty-six different strains representing exposures to air by the different methods in relation to poliomyelitis and eleven different strains from air in relation to encephalitis were inoculated. The number of inoculations of cultures and filtrates of chick-embryo cultures before animal passage, the number of inoculations of emulsions or filtrates of emulsions of brain and spinal cord after from one to seven animal passages and the incidence of development of symptoms are summarized in table 7. The occurrence of paralysis was highest after inoculation of strains ob-

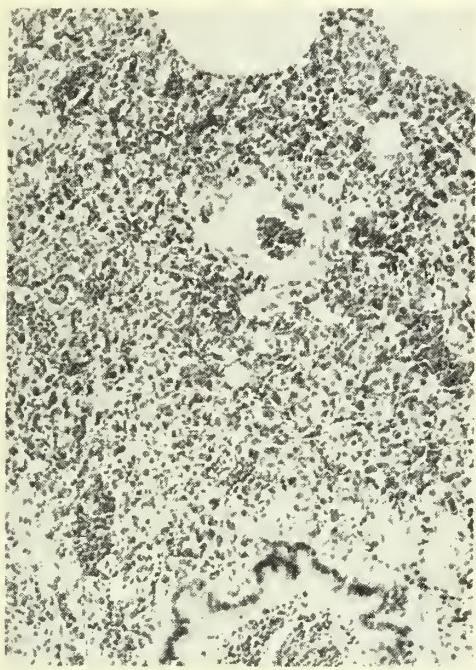


Fig. 4. Microscopic lesions of the lungs of a rabbit that had died forty-eight hours after intracerebral inoculation of streptococci obtained from the air of a room occupied by a person having acute influenza. Note degeneration of alveolar lining, hemorrhage and exudation into bronchi and alveoli, and areas of extreme dilatation of alveoli (hematoxylin and eosin stain, x 160).

tained from air in relation to epidemic poliomyelitis, and the occurrence of lethargy, muscular spasms and other symptoms of encephalitis was highest after inoculation of strains obtained in relation to epidemic encephalitis. In most instances it is not certain whether the characteristic symptoms that developed after inoculation of filtrates were due to "natural" virus obtained from the air or to an infectious agent resembling virus derived from streptococci. However, in some instances the latter origin was likely because material injected represented pure cultures of streptococci far removed from original source.^{5,20,21} The symptoms that occurred after inoculation of cultures containing the streptococcus isolated from air in relation to poliomyelitis were chiefly those of polioencephalitis, whereas those that occurred after inoculation of filtrates more closely resembled poliomyelitis. The latter especially was true after several animal passages.

Cultures were made from the brains of twenty-seven monkeys that had died or had been anesthetized, twenty-one (78 per cent) of which yielded the streptococcus.

GROSS AND MICROSCOPIC LESIONS

Lesions more or less characteristic of those observed in naturally acquired diseases and of those described after inoculation of the streptococci isolated in studies of encephalitis^{1,8,10} and poliomyelitis^{4,22-24} were found in rabbits, mice, guinea-pigs and monkeys. The lesions of lungs, bronchi and trachea of rabbits (fig. 3) and guinea-pigs after intracerebral inoculation, and of mice after intranasal inoculation, of streptococci isolated from

indoor or outdoor air during epidemics of respiratory infections, including influenza, resembled, in essential respects, those found among patients and those that occurred in mice after intranasal inoculation of influenza virus. Patchy or diffuse hemorrhagic edema and interspersed regions of emphysema, with exudation and cyanotic congestion of mucous membrane of trachea and bronchi, were found among animals that had died or had been anesthetized soon after inoculation. Patchy regions of consolidation (bronchopneumonia) of varying size and distribution were found late.

The microscopic picture of the acute phase of the reaction consisted of dilatation of alveoli and of capillaries, necrosis of alveolar epithelium, edema and hemorrhage in the alveoli and exudation into bronchi (fig. 4), whereas later, during the pneumonic stage, there was infiltration by polymorphonuclear leukocytes, in which a greatly variable, but usually small, number of streptococci were demonstrable.

There were examined sections of lungs, brain, medulla or spinal cord of altogether 244 mice, 187 rabbits, forty-seven guinea-pigs and twenty-four monkeys or a total of 502 animals inoculated with streptococci from air or with material derived from the streptococcus isolated from air. Numerous hemorrhages, without ulceration, occurred in intestines (fig. 5) and larger hemorrhages, with or without ulceration (fig. 6), often were found in the stomach of rabbits in which diarrhea had developed after inoculation of the streptococcus or diplostreptococcus isolated from air during epidemics of gastro-enteritis. Sections through hemorrhages or ulcerating regions of the mucous membrane of stomach and intestines revealed extreme dilatation of vessels in the submucosa and hemorrhage between acini in the mucosa, with or without degeneration or sloughing of epithelium. Diplococci were demonstrated with difficulty in the hemorrhagic and ulcerating regions.

Localization and type of lesions of brain and spinal cord that occurred after intracerebral inoculation of streptococci isolated from air during epizootics of equine encephalomyelitis and epidemics of encephalitis and poliomyelitis varied greatly as regards distribution. However, there was a truly remarkable tendency of the streptococci to localize and produce lesions in nervous tissues corresponding to those involved in the natural disease in question. Gross infiltration over the anterior surface of the medulla, parenchymatous and cellular infiltration and localized regions of degeneration were the outstanding lesions after inoculation of streptococci from air in relation to cases of epidemic or persistent postoperative hiccup (fig. 7). Lesions of the brain were maximal, with only slight lesions of the spinal cord, after inoculation of the streptococci isolated from air during epidemics of equine encephalomyelitis and encephalitis of human beings (fig. 8). On the other hand, lesions of the brain were relatively slight and lesions of the medulla and the spinal cord, especially of the anterior horns, were relatively pronounced after inoculation of streptococci isolated from air during epidemics of poliomyelitis (figs. 9 and 10).

TABLE 8
Results of the agglutination test with antistreptococcal serums and streptococci isolated from dextrose-brain broth and chick-embryo medium exposed to air in relation to epidemic respiratory and other infections

Streptococci from air in relation to epidemics of	Air	Specimens or strains	Cultures	Percentage incidence of agglutination by antisera prepared with streptococci isolated in studies of				
				Influenza	Encephalitis	Poliomyelitis	Arthritis	Ulcerative colitis
Influenza	Indoor	90	113	66	15	4	4	5
	Outdoor	79	123	61	8	2	2	11
Equine encephalomyelitis	Outdoor	7	15	0	87	7	7	0
	Indoor	18	18	0	94	6	0	
Encephalitis	Outdoor	114	228	4	79	13	3	0
	Indoor	21	59	25	71	0	0	5
Hiccup	Outdoor	40	54	19	59	0	0	7
	Indoor	89	96	4	19	67	6	2
Poliomyelitis	Outdoor	44	52	0	10	83	4	4
	Indoor	6	8	13	0	0	0	88
Infectious gastro-enteritis	Indoor	41	43	16	21	21	19	7
	Outdoor	24	57	14	19	16	14	0
Remote from epidemics								

Diffuse, suppurative meningitis almost never developed. Necrosis with formation of abscess at the point of inoculation occurred often. Congestion of vessels, edema and hemorrhage, with or without leukocytic infiltration, surrounding vessels and in parenchyma far remote from the point of inoculation, were found regularly in the case of animals that had succumbed or had been anesthetized soon after inoculation. Perivascular and localized infiltration by lymphocytes in meninges, choroid plexus and parenchyma and circumscribed regions of degeneration of ganglion and other cells, far remote from the site of injection in the brain, with or without lesions at the point of injection, were found in animals that had succumbed or had been anesthetized five days or longer after inoculation.

Streptococci usually were demonstrable readily in gram-stained sections of the acute lesions but were demonstrable with difficulty, or were not found, in regions of lymphocytic infiltration. They were never found remote from lesions and the lesions of spontaneous encephalitis were not found in any of the sections examined.

The location of the microscopic lesions and the type of infiltrating cells

found long after inoculation of the respective streptococci were especially characteristic but the pattern and degree of cellular infiltration were less typical and less pronounced than in the lesions which occur in the respective naturally acquired diseases and in animals after inoculation of the respective viruses.



Fig. 5. Hemorrhage of the colon of a rabbit in which severe diarrhea had developed with death occurring forty-eight hours after intracerebral inoculation of gram-negative diplostreptococci isolated from the air of a room occupied by a person having epidemic infectious gastro-enteritis ($\times 1\frac{1}{2}$).



Fig. 6. Hemorrhage and ulcer of the stomach of a rabbit that had died and in which diarrhea had developed three days after intracerebral inoculation of gram-negative diplostreptococci isolated from the air of a room occupied by four persons of a family group having epidemic infectious gastro-enteritis ($\times 1\frac{1}{2}$).

RESULTS OF AGGLUTINATION TESTS

The results of experiments on agglutination by different antistreptococcal serums of streptococci isolated from indoor and outdoor air in relation to epidemic respiratory and other infections and remote from epidemics are summarized in table 8. The incidence of agglutination of the streptococci by the antisera prepared with streptococci isolated from persons while ill with the epidemic disease in question or with closely

TABLE 9
Precipitation reaction between heterologous antistreptococcal serums and water (rendered isotonic) that had been exposed to air in relation to epidemic respiratory and other infections

Source of antigen: water exposed to air in relation to epidemic		Air	Exposures	Percentage incidence of precipitation by antisera prepared with streptococci isolated in studies of				
				Influenza	Ulcerative colitis	Encephalitis	Poliomyelitis	Arthritis
Influenza and related infections	Respiratory	Indoor	185	72	31	15	5	23
		Outdoor	148	68	14	20	14	22
	Gastro-intestinal	Indoor	21	62	81	14	10	14
		Outdoor	23	61	52	13	43	17
Gastro-enteritis	Indoor	20	40	90	25	5	25	
	Outdoor	50	68	64	10	6	18	
Hiccup	Indoor	20	75	0	65	25	15	
	Outdoor	34	38	38	47	18	26	
Encephalitis	Indoor	59	7	18	85	53	32	
	Outdoor	181	4	2	72	4	9	
Poliomyelitis	Indoor	104	22	16	31	78	10	
	Outdoor	138	7	6	21	75	13	
Control: remote from epidemic		Indoor	164	5	3	10	6	7
		Outdoor	201	11	3	11	5	4

TABLE 10
Precipitation reactions between antistreptococcal and antiviral serums and washings of dusts from vacuum sweepers and air-conditioning filters, and with water rendered isotonic after exposure to indoor and outdoor air

Material used as antigen	In zones of epidemic	Dilution of filtrates	Washings or exposures	Percentage incidence of precipitation by antisera prepared with					Virus of equine encephalitis		
				Streptococci isolated in studies of							
				Influenza	Ulcerative colitis	Encephalitis		Poliomyelitis	Arthritis		
Filtrates of 10 per cent washing in saline solution of dusts from vacuum sweepers and air-conditioning filters.	Influenza	1 : 100	9	66	22	11	22	33	33	22	0
		1 : 1,000		66	0	0	0	0	0	0	0
	Encephalitis	1 : 100	9	0	0	100	100	44	0	100	44
		1 : 1,000		0	0	67	56	0	0	22	0
	Poliomyelitis	1 : 100	9	22	0	66		88	33	11	11
		1 : 1,000		0	0	0		66	0	0	0
Water rendered isotonic after exposure to indoor or outdoor air during epidemics of	Influenza	120	74	23	23	18	8	22			
	Infectious gastro-enteritis	46	17	70	13	15	11	9			
	Encephalitis	181	14	8	60	59	21	18	35	11	
	Poliomyelitis	56	2	4	30	18	61	16	9	0	
	Controls remote from epidemics	98	4	3	8	1	1	9	3		

*Some of the exposures to air reported in this table were tested also as shown in table 8.

related disease, uniformly was much higher than the incidence of agglutination by the more distantly related antistreptococcal serums. Agglutination by normal horse serum used as a control was minimal or absent and hence no mention of it is made in table 8. In agreement with the experiments on specificity of streptococci in animals the incidence of agglutination was higher—except for poliomyelitis—in the case of streptococci isolated from indoor air during epidemics than in the case of corresponding strains of streptococci isolated from outdoor air. There was no specific agglutination of strains obtained remote from epidemics by the respective antistreptococcal serums.

In agglutinin-absorption experiments the streptococci used in preparation of the respective antisera specific-

cally absorbed the agglutinins for the respective epidemic strains of streptococci isolated from air.

RESULTS OF THE PRECIPITATION TEST

The results of the precipitation test between the different antistreptococcal serums and water brought to isotonicity after exposure to indoor and outdoor air and between the respective antisera and washings in 0.85 per cent saline solution of oiled fiberglass that had been exposed to outdoor air are summarized in table 9. The respective homologous antistreptococcal serums invariably gave a higher, and usually much higher, incidence of positive reactions with washings of air obtained during epidemics than did the more distantly related antistreptococcal serums or than was obtained with all of the anti-

serums and washings of air remote from epidemics. Control precipitation tests made with the different antiserums and unexposed distilled water rendered isotonic and saline solution washings of unexposed fiberglass always gave negative reactions.

The incidence of specific reactions in the precipitation test, as in the agglutination test, and evidence of specificity in animal experiments usually were higher in the case of exposures to indoor air than in corresponding exposures to outdoor air. The incidence of isolations of streptococci from dextrose-brain broth and chick-embryo medium exposed to air, the incidence of positive precipitation reactions with the water exposed at the same time and the finding of streptococci in the sediment of the exposed water ran closely parallel, although the number of streptococci in the sediment of exposed water often was surprisingly small.

The close antigenic relation or identity of the respective streptococci isolated in studies of epidemic encephalitis of human beings and horses and similarity of antibody in antiserums prepared with the respective streptococci and equine encephalomyelitis virus (Western type) have been shown previously.^{8,19,20,25} A summary of precipitation tests made with these respective antiserums and the washings of dust from vacuum sweepers and air-conditioning filters and with water rendered isotonic after exposure to indoor and outdoor air in relation to encephalitis, poliomyelitis, influenza and gastro-enteritis, and remote from epidemics, is given in table 10. Water exposed to air and washings of dust in relation to encephalitis gave a specifically high incidence of clouding at the interphase with the encephalitis antistreptococcal serum prepared with strains isolated in studies of human and equine encephalitis, respectively, and with the antiviral serum (Western type). Washings of dust and water exposed to air in relation to poliomyelitis or influenza and water exposed to air in relation to gastro-enteritis did not give a positive reaction with the foregoing antiserums but a high incidence of clouding occurred between each of these and the respective specific antistreptococcal serums. Water exposed to air remote from epidemics almost never gave a positive reaction with the various antiserums.

In order to be certain that a positive precipitation reaction between the anti-streptococcal serum and the exposed water, after it had been rendered isotonic, was due to streptococcal antigen and not to soluble products or antigens from gram-positive and gram-negative bacilli and micrococci which were absorbed from the air with the streptococci, comparable suspensions were made in saline solution of pure cultures of the streptococci, gram-positive and gram-negative bacilli and micrococci. The clear supernatants, after centrifugation of the respective tenfold dilutions of suspensions containing from 5,000,000,000 to 50,000 organisms per cubic centimeter, were used in precipitation tests with the different antistreptococcal serums. Only the supernatants from 500,000 or more streptococci per

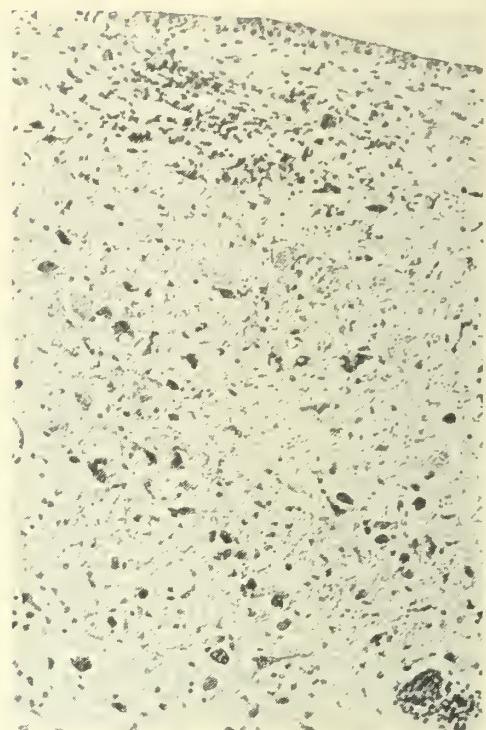


Fig. 7. Lesions of the medulla of a rabbit in which spasms of the diaphragm and marked weakness of extremities had developed after intracerebral inoculation of streptococci isolated from the air of a room occupied by a person having epidemic hiccup (hematoxylin and eosin, x 170).

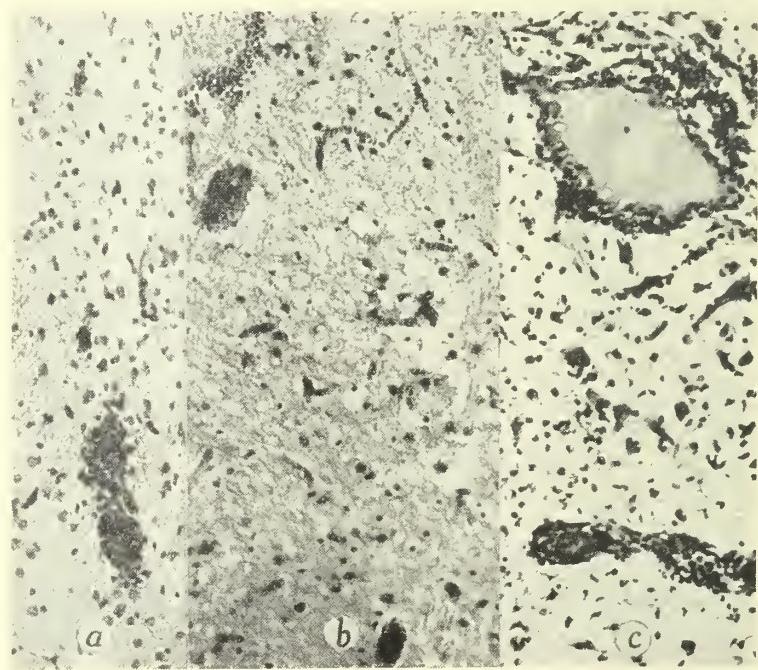


Fig. 8. Lesions of the brain of animals (a and b, mice, and c, a Macacus rhesus monkey) that had succumbed to symptoms of encephalitis five, three and seven days, respectively, after intracerebral inoculation of "virus" derived from streptococci (a and b) or chick-embryo cultures of streptococci (c) isolated from outdoor air during epidemics (hematoxylin and eosin stain, x 170).

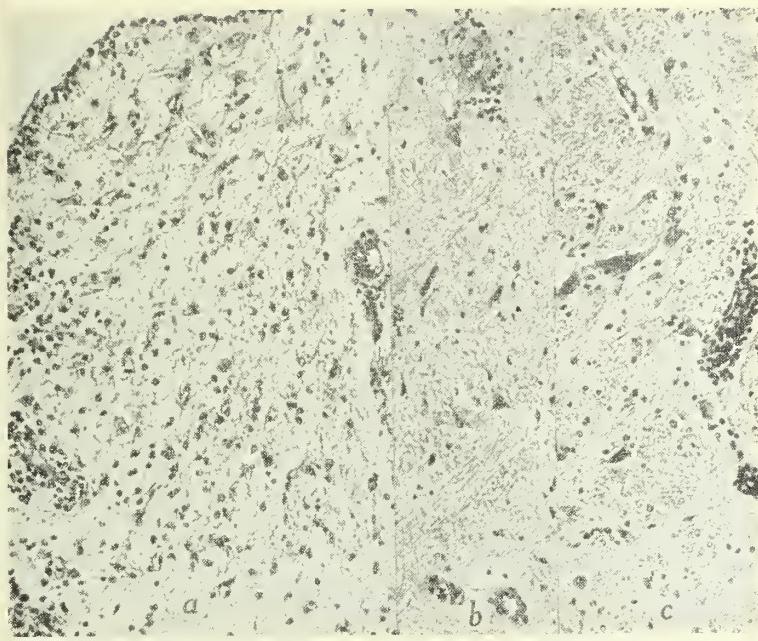


Fig. 9. Lesions of the pons and the spinal cord of animals that had succumbed to flaccid paralysis (a and b, monkeys, and c, a rabbit) five and four days, respectively, after intracerebral inoculation of chick-embryo cultures of streptococci isolated from outdoor air during two epidemics of poliomyelitis (hematoxylin and eosin stain, $\times 170$).



Fig. 10. Lesions of the medulla and the spinal cord of three monkeys fifteen, five and ten days, respectively, after inoculation of chick-embryo medium cultures (a) and filtrates of chick-embryo medium cultures (b and c) of streptococci, far removed from original source, isolated from the air of rooms occupied by persons having acute poliomyelitis (hematoxylin and eosin stain, $\times 170$).

cubic centimeter revealed clouding at the interphase.

When my colleagues and I first discovered that antiseraums characteristic of epidemics in question gave interphase precipitation reactions with water through which air had been bubbled or which had been exposed to currents of air and with saline solution washings of fiberglass that had been exposed to air in open test tubes, we immediately subjected to the precipitation test samples of casual water that had been exposed to air for many days. It was expected that strongly positive reactions would result but only slight or no reactions were obtained. This observation is in accord with that of Dubos²⁶ on the beneficent action of gram-positive bacilli obtained from soil. We then found that water which had been exposed to air for twenty-four to forty-eight hours gave a positive precipitation reaction and as exposures were continued up to fourteen days the amount of precipitation did not increase appreciably but often diminished progressively. Gram-positive bacilli always were present in the exposed water. The supernatant of centrifuged suspensions of the bacilli and filtrates of extracts of respective alpha streptococci isolated from outdoor air were mixed. This mixture and the filtrates of extracts of streptococci only were subjected to the precipitation test before incubation and after incubation at 35° C. for two to six days. The streptococcal antigen in the mixture containing the bacilli appeared to be digested or destroyed. This conclusion is based on the fact that the precipitation reaction with the respective anti-streptococcic serums was positive before and shortly after incubation but became negative on incubation for four to six days, whereas the results of parallel precipitation tests with filtrates of the extracts of streptococci remained positive.

Additional striking results were obtained during this study indicating the reliability of our methods and the significance of the presence in indoor and outdoor air of specific types of streptococci and streptococcal antigen. Only a few instances will be cited.

Streptococci that had neurotropic virulence and that were agglutinated specifically by the encephalitis antistreptococcic serum were isolated from, and streptococcal antigen that yielded a high incidence of positive precipitation

reactions with the encephalitis antistreptococcal serum was demonstrated in sixty (77 per cent) of seventy-eight exposures made to outdoor air at high levels (1,000 to 2,000 feet [300 to 600 meters]) on airplane flights within the epidemic zone of encephalitis and return, on August 30 and 31, 1941. Streptococci that had pneumotropic virulence and that were agglutinated specifically by the influenza antistreptococcal serum were isolated from thirty-four (44 per cent) of seventy-eight similar exposures made eleven and a half weeks later (November 21 and 24, 1941), after encephalitis had disappeared and epidemic infections of the respiratory tract had appeared. Corresponding antigen was demonstrated, in high incidence, in these thirty-four exposures. Streptococci grew in cultures from only two, and streptococcal antigen was not demonstrable in any, of ten similar exposures made during airplane flights remote from epidemics of encephalitis and infections of the respiratory tract.

All of eight samplings of outdoor air which I obtained during a drive of 950 miles (1,500 kilometers) within the epidemic zone of encephalitis in 1941 yielded neurotropic streptococci and streptococcal antigen. Only two of twelve similar samplings obtained at the same time during a drive of 2,150 miles (3,500 kilometers) outside of the epidemic zone yielded streptococci and demonstrable precipitinogen.

During an automobile drive of 300 miles (500 kilometers) on October 8, 1938, outdoor air was drawn through dextrose-brain broth. At intervals of 50 miles (80 kilometers) subcultures were made from the dextrose-brain broth by inoculation of tubes of dextrose-brain agar, each with 2 cc. From fifty to 200 colonies of streptococci were obtained in each of six tubes of the dextrose-brain agar. The weather was clear and sunny and the air was laden with dust, for there had been a long dry spell. An epidemic of equine encephalitis had disappeared from the region from which I started and epidemic respiratory infections had appeared. Equine encephalitis was still present in the region surrounding my terminus but infections of the respiratory tract were absent. Pneumotropic streptococci only were isolated during the first three intervals of 50 miles (80 kilometers) whereas a mixture of pneumotropic and neurotropic streptococci was obtained during the fourth, fifth and sixth intervals. A heavy, prolonged rain covering the 300 miles (500 kilometers) occurred during the night after the trip. During the return drive the next day over the same route, none of the cultures, made in identical manner, yielded streptococci. The water (rendered isotonic) which had been exposed to the air during the 300 miles (500 kilometers) before the rain gave a positive precipitation reaction to only the influenza and encephalitis antistreptococcal serums whereas the results of identical tests made with the water that had been exposed to the air on the return trip after the rain were negative.

Streptococci grew in dextrose-brain broth cultures from thirty-eight of fifty-one samplings of dust obtained from vacuum sweepers and from air-conditioning filters within and remote from zones of epidemic respiratory and other

infections. The streptococci isolated and the washings from dusts during epidemics were agglutinated specifically and tenfold dilutions of washings were agglutinated and precipitated specifically by the respective antiseraums characteristic of the epidemic in question.

Cultures from washed and filtered air of air-conditioning units and from air of air-conditioned rooms yielded streptococci about as often as those from the air of similar rooms not so equipped. In instances in which air was recirculated or the filters had not been cleaned or changed for a long time, the incidence of isolation of streptococci from, and demonstration of streptococcal precipitinogen in, the air was greater than in the case of air of similar rooms ventilated with windows. In family groups living in homes heated with forced, filtered hot air, infections of the respiratory tract disappeared when air-conditioning filters were changed or removed.

In epidemic zones remote from cities, water from first rains, which often was cloudy after long dry weather, yielded streptococci and streptococcal precipitinogen characteristic of the epidemic in question, whereas in large cities remote from epidemics the water from first rains after long dry spells frequently yielded streptococci of different types and precipitation reactions were obtained with all of seven different antistreptococcal serums used. Streptococci were not isolated from, and streptococcal precipitinogen was not demonstrated in, water from second or third rains soon after heavy first rains. Streptococci and streptococcal precipitinogen were demonstrated only infrequently in the water from first rains remote from epidemics. Precipitation tests were made between five different antiseraums and samples of water obtained from twelve first rains in the country remote from epidemics. All gave negative results. Similar precipitation tests were made with the antistreptococcal serums and water from twelve first rains in the epidemic zone of encephalitis. Ten of the samples yielded a positive reaction with the encephalitis antistreptococcal serum; five, with the poliomyelitis antistreptococcal serum and two each with the arthritis and ulcerative colitis antistreptococcal serums. None of the samples gave a precipitation reaction with the influenza antistreptococcal serum.

Alpha streptococci were isolated from eight of twenty-three samples of snow. Of the eight samples that yielded streptococci, four were obtained from freshly fallen snow February 8, 1941, at the onset of an epidemic of influenza when the ground had not been covered with snow nor had it rained for several weeks (one sample was from the roof on the sixteenth floor of an office building and one was from ground level in a city, one was from the outskirts of the city and one was obtained 2 miles [3 kilometers] out in the country remote from habitation by human beings and animals), two samples were from fresh snow that fell on September 25, 1942 (one sample being obtained from the top of a sixteen story building and one from out in the country far from persons and animals), and two samples were from snow that had been on the ground in a vacant lot for several weeks. None of four samples of fresh snow that fell two weeks after the snowfall of February 8 and none of four samples obtained five weeks later yielded streptococci. The

weather was cold and the ground had remained covered with snow meanwhile.

The streptococci isolated from snow during the epidemic of respiratory infections in February, 1941, had extremely high pneumotropic virulence, producing pneumonitis on intracerebral inoculation of rabbits and intranasal inoculation of mice. On successive passage of emulsions of pneumonic lungs from these animals an influenza virus phase of the streptococcus developed.²⁷

The melted snow from which the streptococcus was isolated usually gave a faintly positive precipitation reaction with the different antistreptococcal serums. Samples of snow that did not yield the streptococcus in cultures invariably failed to give positive precipitation reactions.

In many instances streptococci were not isolated from, and precipitinogen was not demonstrable in, washings from fiberglass exposed for three or four days to outdoor air on weather vanes in arid desert regions remote from epidemics. Interestingly, streptococci and streptococcal antigen also were not obtained from, or demonstrated in, exposures to air which was completely saturated with moisture in ventilated tunnels of a silver mine 5,000 feet (1,500 meters) under rock.

SUMMARY

Specific types of alpha streptococci were isolated from, and corresponding specific streptococcal precipitinogen was demonstrated in, indoor and outdoor air in relation to epidemic respiratory and other infections.

The number of streptococci obtained from, and the amount of streptococcal antigen demonstrated in, air during airplane flights and other exposures made during epidemics, far removed from human habitation, were greater than could be accounted for by simple dilution according to the cube of the distance of "droplet nuclei"¹⁶ from persons.

The source of the streptococcus and corresponding antigen in indoor air is readily explicable^{8,21,25} but the presence, during epidemics, of specific types of streptococci and antigen in outdoor air far remote from habitation, is difficult to reconcile with current epidemiologic knowledge. Some obscure, underlying influence seems to cause streptococci that are broadly present in nature to acquire certain specificities characteristic of streptococci associated with epidemic diseases. The streptococci isolated from air during epidemics usually were not as virulent but were as specific in localizing power and in precipitation and agglutination reactions as the streptococci isolated from persons afflicted with the respective epidemic diseases and from some well contacts and non-contacts in epidemic zones.

The morphologic characteristics and staining reactions of the streptococci from air were similar to those of streptococci isolated from the nasopharynx, cerebrospinal fluid or systemic lesions of persons ill with, or who had died from, the respective epidemic diseases.

The gross and microscopic pictures of the respective diseases have been simulated closely in rabbits, mice and monkeys after inoculation of alpha streptococci as isolated from air. The streptococci have been shown to

have distinctive distribution curves of cataphoretic velocity.

Encephalitis and transmissible encephalitis virus⁸ were produced in mice and fish by causing them to respire the encephalitic type of streptococcus isolated from outdoor air during airplane flights in an epidemic zone of encephalitis.

From the results of this extended study of streptococci isolated from indoor and outdoor air in relation to epidemic diseases it is suggested (1) that air-borne streptococci may be of epidemiologic and etiologic importance, (2) that they may be a source of the viruses now considered to be the etiologic agent of some of the diseases studied and (3) that the disappearance of epidemics may be due, in part, to inhalation by the population of specific antigen in addition to unapparent and apparent infection. Prophylactic immunization with specific types of streptococcal or "viral" vaccines in advance of anticipated epidemics or abreast with epidemics and specific treatment with antiserums or vaccines having antibody-like effects would seem necessary, in addition to present-day methods,^{8,16,21,27} to cope adequately with epidemics such as those studied.

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Justice and the Future of Medicine*

(A Digest)

Wendell Berge†

Washington, D. C.

LET me confess that I stand somewhat in awe of my subject. Justice, medicine, the future, are all mysteries about which man can know but little.

From the medicine man of old to the modern clinic is a long way. Again and again mystery after mystery has been probed; again and again the utterly impossible has won acceptance against ancient truth; again and again the reach of medicine has been enlarged. The doctor's craft, with triumph after triumph to its credit, is still on its way. Yet it is set within a larger problem of human well-being which up to now has hardly been explored. It will not be solved until we learn to make culture in all its color and drama an instrument of health.

A beginning of understanding lies in a recognition of a distinction between the technology of medicine and its organization. By technology I mean all of those arts of diagnosis, therapeutics, surgery, radiology, dentistry, and the like, which constitute the profession of medicine. By organization I mean all of the arrangements, social and economic, by which medical service is made available. In the advance of the arts of medicine, you have done a brilliant job. In the face of this advance it is all the more tragic that progress in the organization of medicine has lagged—and, because of this lag, the nation has not had the full benefit of your superlative performance.

For backwardness in organization I am not disposed to pass out blame. But we should be quite frank in looking into reasons. You must be able to state your problem before you can solve it. When I hear the question put as a choice between "private practice" and "socialized medicine," I cannot escape noting a confusion and dogmatism strikingly different from the scientific approach. As for the "either or" of private practice and socialized medicine, there is no such question. There are a myriad of schemes under which the doctor and the patient may be brought together—not a choice between just two.

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Organization demands a cooperation of professions which is not yet a going fact. As now we take counsel together we are not going to clear up the problem. But this is the kind of thing, multiplied a myriad of times over, cut of which will some day emerge the answer to the question of justice and the future of medicine.

Not so long ago in my official work, the public character of the doctor's calling was vividly brought home. I was one of "the small group of willful men" who instituted the antitrust suit of the United States against the American Medical Association. To us the American Medical Association seemed to be attempting to keep group health from having an opportunity to prove—or to disprove—its case. And we were convinced—the courts have now agreed with us—that the tactics were clearly illegal.

With the victory of the Government in the Supreme Court the case is now closed. I advert to it only because it has current significance. It is, to borrow a term from your profession, a symptom of a pathological condition in the organization of medicine. The fault is not individual, but institutional. The cleavage is not to be eradicated by invectives, by isolation from modern thought, by clinging stubbornly to that which was once good. It can be resolved only by an escape from folk lore, a probing diagnosis, a conquest of prejudice, a drive at the very heart of the malady.

The art of medicine has refused to stand still. The family doctor—with his bed-side manner, his nostrums, his ponderous vocabulary to conceal his perplexities, his downright devotion to duty and sacrifice of self—was once the very epitome of the art of healing. He has been succeeded by the general practitioner who is focus to a group of specialists, of which there are now more than a score, each with what a lawyer would call its own jurisdiction.

The community which the physician must serve has changed with the times. Our society has become urban, industrial, gregarious. We have become a new sort of wanderers, a race of modern nomads operating a material culture.

Within this urban, industrial, wage-earning society, men and women are becoming increasingly conscious of what they want. Our workers demand health as a condition of their livelihoods. They insist upon adequate medical service at a price they can afford to pay, and in their newly-won self-respect they will refuse all charity.

A changing medicine has not yet been adapted to its new world. The high objectives of the profession endure, for they are eternal. But they must be freshly applied. Our society can not be served by an instrument designed to fit the family physician into the village community.

It is not that on the whole physicians are paid too much; the statistics I have seen lead me to believe that remuneration is quite inadequate. It is rather that there is waste, a failure fully to use facilities, a lack in getting the most out of a trained personnel.

Here then is challenge. The arts of medicine have advanced; the importance of medicine has been enhanced; it has become a necessity to the people and an essential in the operation of the industrial system. It has outgrown the organization into which in days of petty trade it was cast. The demand is for a vaster, more comprehensive, more reliable medical service. If an instrument of the common health can be provided on terms the people can afford, the people will rejoice. If you do not help them to it, the people will seize upon whatever agencies are at hand as a help in need. For the universal demand that the common health be served can not much longer be stayed.

I can understand how, in the face of a new venture, you wonder whether change may not fail to constitute progress. I am certain that there will be serious loss if you sit upon the side-lines and allow whoever may come to power to shape this new medical order.

As medicine gropes for a new organization, we all hear a lot of the doubts and fears of the profession. Many doctors are fearful lest objectives, which have been hard won and which they value highly be lost.

A great many physicians are justly fearful that the quality of service be compromised. But I cannot follow the argument that a causal relation exists between government auspices and poor medicine.

Much is said, too, about the maintenance of a "personal relation" between doctor and patient. The court declared that medicine can only be practiced by physicians and that Group Health, a corporation, did no more than furnish the auspices under which doctor and patient were brought together. Whatever the character of the organization, the relation is in essence personal.

Your code of medical ethics has always elevated the relief of suffering above the pursuit of gain. My limited experience indicates—and a number of colleagues to whom I have put the question concur—that the mightiest urge to which the physician responds is the pride, the drive, the keeping faith with his calling.

To say that a doctor will give his utmost if he acts as his own business agent, and that his incentive will be stifled if he received a salary, is not borne out by experience. The time was when the great scientific advance was the work of the solo inventor. Today the most creative

of all work—the progress of science and the useful arts—is the product of men on salary.

Why is it, that doctors are troubled by this doubt when university professors, lawyers in public service, officials who make of government a life-work, never even raise the question?

As for myself I have no more fear of a venture of the State into medicine than I have of a venture of the State into law.

You are right in insisting that high standards of medical care must not be compromised. But standards are a professional matter. Their chief dependence is upon adequacy of resources. They are not inherent in any type of organization. Your current ways, as well as state medicine, has its insidious dangers. And, since comparative merits are at issue I am not content with any argument which points out vices in the one without looking at the faults of the other. As it is now practiced, medicine is exposed to the corroding ways of business.

I am not, mind you, presenting a case for or against the prevailing system, state medicine, or any particular medical order. There is, as I said in the beginning, no such question as "private practice" versus "socialized medicine." For practice is never private and all medicine has a social function. The question you and I face is harder, more intricate, far more detailed than any such antithesis suggests. First of all you must ask what you want medicine to do. That is easy; to furnish to the whole population an adequate service of quality upon terms it can afford. Next you must contrive ways and means for seeing to it that the great variety of services we call medicine are called into play to serve the common health. Next you must set up protections against the hazards you and I see so clearly. And finally all of these arrangements must be brought together into a going organization. Such a result is not to be attained by an act of faith or a single trial. The conditions of health vary from city to country, from section to section. The needs of the people as locally felt must be met, and this means variety, flexibility, and capacity for adaptation. It means, seek—honestly, objectively, courageously—and ye shall find; knock at many doors until the right ones shall be opened to you. There is no royal road to a modern medical order. And thus the system we seek is no choice between "private practice" and "socialized medicine."

The question demands, not an easy answer, but painful, constructive, detailed thought. It demands, too, an indulgence in downright trial and error without which nothing worthwhile emerges.

Last but most important of all, the war has given a quick step to a trend long in the making. A host of physicians now in service are conscious of the shortcomings of "military medicine" and have scores of suggestions as to how it can be improved. But they have become aware of the tremendous possibilities which inhere in a medicine directly organized to perform its function. And millions of soldiers, returned from the front, are going to demand for themselves and for their families the instruments of health to which they are entitled.

The course of events moves fast and a new medical order seems inevitable. My fear is not that we will not get it—an awakened public, sparked by our veterans, will see to that. My fear is that we will not bring to its creation all the knowledge, wisdom and understanding we possess.

Support of the doctors is essential to the salvation of the movement. If doctors oppose, or stand on the sidelines, the layman will create a medical order which may prove to be indifferent or even blind to the values doctors prize most. If the doctors assume a role in its creation, they can see to it that no compromise is made with the standards of the profession.

The problem thus becomes one of creation. In respect to the selection of personnel, the standards of care, the carrying of risks, the methods of payment, the manner of remuneration a score of ways are open. The form of organization may follow an agency of state, the university pattern, the hospital set-up, or a combination of devices from all these. The government may dominate the system, become one of a number of parties to its management, or be excluded from it altogether. The venture may fall into the legal forms of a Public Health Au-

thority, a non-profit-making corporation, a series of independent or interlocking corporations, a group of consumers cooperatives, a mutual association of the profession and the laity, or still something else. Its direction may be lodged with a tripartite board, representing the government, the public, and the profession; or the public and the profession, free from government interference, may assume joint responsibility. It may or may not be state medicine; it cannot escape being social medicine.

Many arts must converge into the new medicine; prevention, sanitation, the public health must become a part of it. At its hub must stand the doctor, it is he who must direct this vast apparatus of skills, specialized personnel, facilities to the service of the human being. The medical order I suggest—and which the American people are going to have—will be vaster and mightier than anything we now know.

An instrument of the common health, such as never before has been offered to a people, is within our reach. This is no time for petty doubts and timid moves. In the face of a national challenge we must—as one of our great jurists said of the law—let our minds be bold.

Book Reviews

Control of Pain in Childbirth, by CLIFFORD B. LULL, M.D., F.A.C.S., and ROBERT A. HINGSON, M.D., with a Foreword by NORRIS W. VAUX, M.D. Philadelphia: J. B. Lippincott Co., 386 pages including appendix, 132 illustrations (32 in color), index, bibliography, 1944, price \$5.00.

In the space available it is impossible to give more than a suggestion of the valuable material compiled in this book, compiled not alone for the obstetrician and the anesthetist but primarily for the general practitioner.

The authors have stated in the preface their dominant purposes as follows: (1) "the correlation of the pharmacologic action of the various drugs on both maternal and fetal organ structure; (2) the re-evaluation of indicated and contraindicated drug combinations in cases with known maternal or fetal abnormality or disease; (3) the selection of the type of pain relief best suited to the mother's physical and emotional status; and (4) the perfection and simplification of technic through full utilization of the allied basic medical sciences to the end that the greatest possible maternal and fetal welfare may be attained." All this they have accomplished and considerably more.

Their material, organized in masterly fashion, is presented in three parts. In the first after an intensive and profusely illustrated description of the organs of parturition—special emphasis is placed on neurology—they discuss the physiopharmacology of the agents of general anesthesia, amnesia and algesia. The action, indication and contraindications of each drug are considered separately. Fine color charts are incorporated to show graphically the stimulating and depressing effects of each agent on the organs of both mother and child. A final chapter discusses the psychological element in both pregnancy and labor with special reference to the relation between pain and fear.

The second part traces the history of pain relief in obstetrical practice. Then come detailed accounts of the standard technics used in the management of labor—special interest in caudal anesthesia rises from Dr. Hingson's widely known contributions in this field—suggestions for the puerperium and for home obstetrics.

Part 3 considers the control of pain in maternal complications and the methods used in the resuscitation of the newborn. The book ends with an "epilogue" in which ten "postulates" are set forth as one-paragraph summaries of the most important points that have been elaborated. The end papers of the book provide space for a table of antidotes for overdosage or profound effect of nineteen drugs discussed in the text.

This treatise will be acclaimed not only by obstetricians and anesthetists but by general practitioners and medical students.

The Treatment of Peptic Ulcer, by GEORGE J. HENER, M.D. The Selected Professional Book Series. Philadelphia: J. B. Lippincott Co. 1944; 118 pages with index. Price \$3.

With the assistance of Cranston Holman and William A. Casper, George J. Hener presents a ten-year study of the records of 1,139 cases of peptic ulcer from the surgical service of Cornell University Medical School. The statistical data, for particular subjects, are given broken down in order that the results of several forms of treatment may be properly evaluated.

The results from gastroenterostomy done for peptic ulcer were satisfactory in about 75 per cent of all cases, depending upon how the data were manipulated statistically; and from gastric resection, about 80 per cent. But the mortality rate from resection is about five times as high; that is, gastroenterostomies may now be done at Cornell with expectation of one death in a hundred, and partial gastrectomy still has about 5 per cent death risk.

The patients with gastroenterostomies have been observed for longer periods of time than have those with resection, and it is possible that, for equal periods of time elapsed after operations, the statistical results in the two groups may be similar. Also, marginal ulcers have formed after resection, some have perforated, others have bled; the number may in time equal the 8 per cent incidence of marginal or jejunal ulcer that follows gastroenterostomy.

The mortality rate among the patients with peptic ulcer treated medically was 3.5 per cent and satisfactory results were claimed for only 50 per cent; but, as pointed out, the patients hospitalized were those who had acute ulcers or some complication or threatened complication.

The monograph also discusses the question of malignant change in gastric ulcer, the results of operation for complications, acute and chronic, and of secondary operations.

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MINNEAPOLIS, MINNESOTA, MARCH, 1945

UNIFORM, UNIVERSAL YOUTH EXAMINATIONS

One feature of universal military training must meet with the approval of every physician who has followed the rejection statistics of draft boards and induction centers. We refer to the preliminary physical examination. From Washington where final data is available, Rountree at one time and Carl Menninger at another have made some startling statements. These men are well and favorably known in the middle west and their words carry weight. The information thus furnished to the nation should be thought-provoking and lead to much good in the future.

The American Medical Association was doubtless aroused by physical findings available after World War I, and an effort was made at that time to stimulate a genuine interest on the part of all in periodic health examina-

tions. To promote uniformity of records it prepared, published and sold blank forms suitable for that purpose. The reaction to this movement has not been entirely satisfactory. It met, to be sure, with favorable comment from every quarter, we might say universal approval, but not with universal practice. Unfortunately, too, there seems to be less uniformity of procedure in these examinations from year to year. Some are content to have a blood pressure reading now and then, others even though free from symptoms or complaints of any kind insist on all the tests known to medical science; while, alas, the great majority have no check-up at all. In many of our higher institutions of learning an effort has been made through a students' health service to require physical entrance examinations but the information gleaned lacks integration beyond any index that perchance the different schools may decide to keep for their own individual reference.

Whether it be as a preliminary to universal military training or merely as an inventory of our greatest national asset, the health of the people, we advocate a uniform compulsory physical examination of all persons of military age.

A. E. H.

SOME FACTS ABOUT MARGARINE

When a beautiful lady came to us the other day and said: "Is this margarine as nutritious for my family as butter? What is it made of anyhow? Is the coloring important, or just eye appeal?" we found ourselves stymied by the confusion in our own minds on the subject. So we looked it up and with the thought that with butter growing scarcer, its point value soaring, you too may well be confronted with similar questions from house-keeping ladies, we hereby present the facts as offered by the National Research Council.

The minimum requirement of fat per individual per year is 68 pounds. Of these 28 are the "visible" fats, such as butter, margarine, lard, shortening, etc.; 40 pounds come from the "invisible" fats, those associated with foodstuffs such as meats, eggs, cereals, etc.

Present-day margarine — the oleo has been dropped since it seemed to imply animal fats no longer used — is made up chiefly of vegetable oils, milk and salt; some emulsifying such as lecithin, monoglycerides or diglycerides may be used, and a micro-organism or enzyme may be added for the lactic acid flavor. Ninety per cent of all margarine is now fortified with 9,000 units of vitamin A per pound. When prepared thus, as directed by the Food and Drug Administration, no difference in the nutritional value of butter and its cheaper step-sister can be detected. Coconut oil, the most important ingredient a decade ago, has been superseded by soybean and cottonseed oils, and today no coconut or other oils containing high amounts of lauric acid and glycerine are permitted in margarine manufacture. The process of making includes the hardening of a portion of the oils by hydrogenation whereby the unsaturated fatty acids are partially converted to stearic acid plus a number of isomers.

As to the yellow color which the dairymen claim with the jealous possessiveness of a lover for his mistress, except for summer butter it is no more natural than is her lipstick. During the fall and winter the carotene content which produces the yellow butter color, is markedly reduced and the butter manufactureres use coal-tar dyes — as would the margarine men if they were allowed or could afford the extra tax. But the coloring in either butter or margarine affect its nutritional value not an iota, and if her family is so conditioned to yellow as to make a white spread revolting, it would seem to be up to the housekeeper to undertake the fussy job of coloring her margarine herself. At least the manufacturers furnish the dye.

So that is the story — or part of it. Of course the most exciting chapter deals with the legislative fights. But of that we have nothing to say.

M. U.

News Items

A bill which would authorize groups of twenty-one or more licensed physicians to organize non-profit medical service organizations was introduced in both houses of the Minnesota legislature February 1.

The New York Academy of Medicine has issued a report on Medicine and the Changing Order as interim information regarding work of a committee whose final report is not expected until a year hence. Topics covered are: 1) the committee's approach, 2) the education of the public, 3) the hospital, 4) the providing of medical service by corporate bodies, 5) preventive medicine, 6) the hospital, 7) the economics of medicine, 8) medical costs, 9) the use and abuse of social legislation.

The South Dakota Sixth District medical society held a meeting at the Methodist state hospital, Aberdeen, on January 15, at which time the following officers were elected for the year 1945: President, R. A. Weber, M.D., Mitchell; vice president, E. C. Bobb, M.D., Mitchell; secretary-treasurer, F. D. Gillis, M.D., Mitchell; delegates for 1945, W. G. Rieb, M.D., Parkston, C. S. Bobb, M.D.; alternates, O. J. Mabee, M.D., Mitchell, F. G. Tobin, M.D., Mitchell; censors for 1945, S. E. Stegman, M.D., Salem (2 years), B. A. Bobb, M.D., Mitchell (1 year), L. C. Dick, M.D., Spencer (3 years). Dr. J. C. Ohlmacher, dean of the medical school of the University of South Dakota, Vermillion, presented a talk on "Possibilities of a Four Year Medical School in South Dakota."

Dr. Stanley J. Walters was chosen president of Watertown, South Dakota, district medical society at the annual meeting held in Watertown, January 18.

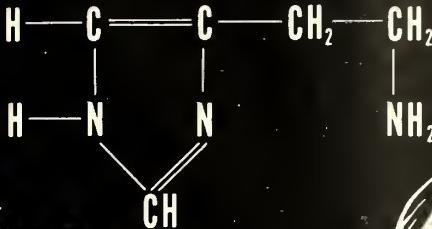
Dr. J. Allen Smith, long a practicing physician at Noonan, North Dakota, is removing to Minot where he will act as eye, ear, nose and throat specialist in the Minot Clinic.

Minneapolis Academy of Medicine

The twenty-fifth anniversary meeting of the Academy was celebrated January 15 at Hotel Leamington, Minneapolis, with a dinner and scientific session presided over by Dr. Stanley R. Maxeiner, chairman of the senior committee. Captain Donald McCarthy, U.S.N.R., gave an address, "Penicillin Therapy in Meningococcic Meningitis."

Past presidents of the Academy are: 1920—Stanley R. Maxeiner, 1921—Edwin L. Gardner 1922—Clifton A. Boreen, 1923—Rae T. LaVake, 1924—Thomas A. Peppard, 1925—James S. McCartney, 1926—Roscoe C. Webb, 1927—James M. Hayes, 1928—Herbert M. N. Wynne, 1929—Walter E. Camp, 1930—Moses Barron, 1931—Frederick H. K. Schaaf, 1932—Archibald H. Beard, 1933—H. Bright Dornblaser, 1934—Erling W. Hansen, 1935—E. Floyd Grave, 1936—Donald McCarthy, 1937—Dale D. Turna cliff, 1938—Erling S. Platou, 1939—James K. Anderson, 1940—Lawrence R. Boies, 1941—Malcolm B. Hanson, 1942—Roy E. Swanson, 1943—Elmer M. Rusten.

(Continued on page 130)

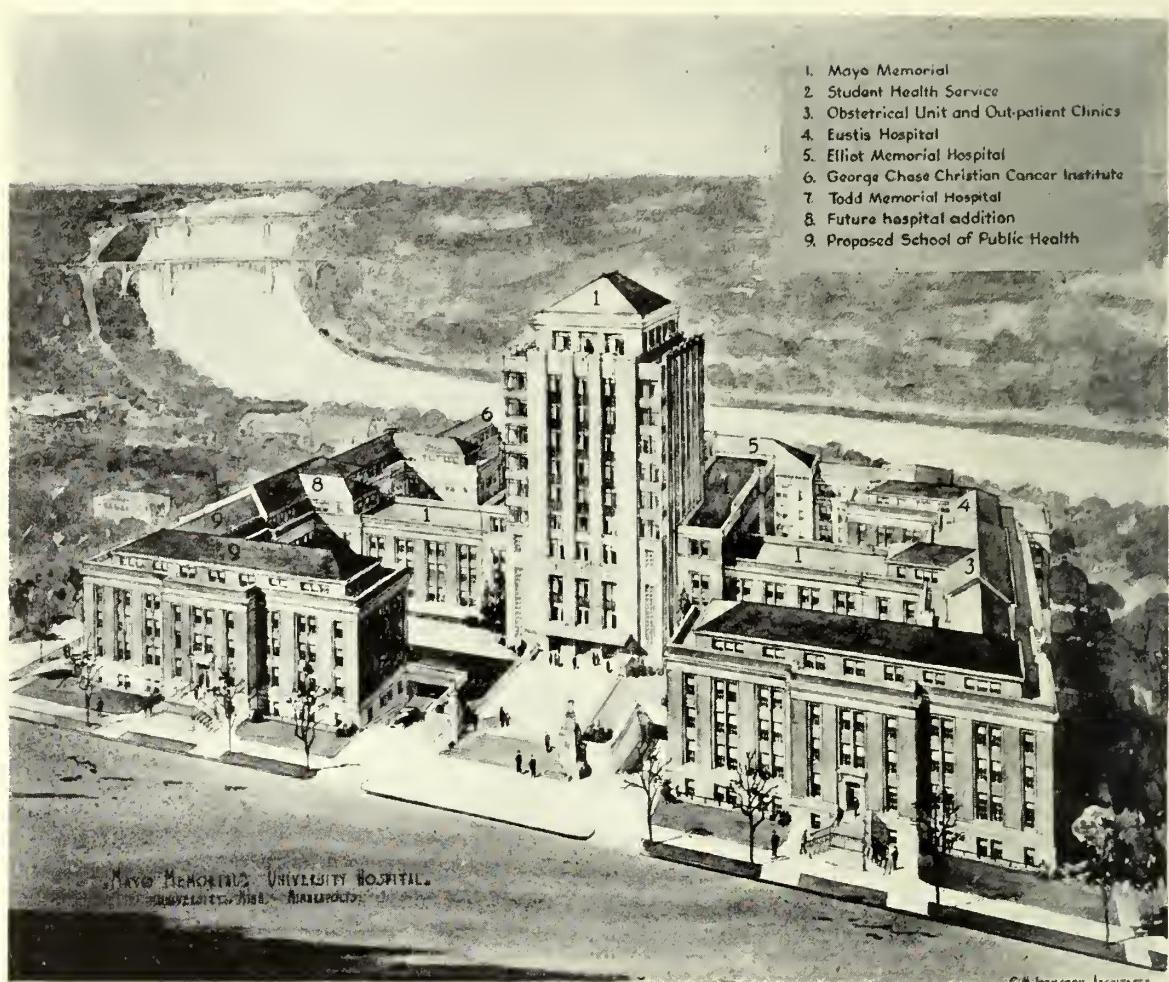


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The Mayo Memorial

Widespread interest among physicians of the northwest has been aroused by announcement of plans for erection on the University of Minnesota medical campus of a center for medical research, teaching and administration as a memorial to Dr. William J. and Dr. Charles H. Mayo.

The proposed memorial was announced early this year by the Committee of Founders, headed by Dr. Donald J. Cowling, president of Carleton college, Northfield, Minn.

The proposed 12-story Mayo Memorial building, to be erected in the center of the University Hospitals quadrangle, will be constructed at an approximate cost of \$2,000,000. Citizens of Minnesota, where the Doctors Mayo were born, where they practiced all their lives and to which they contributed much, both in money and in service, will be asked to contribute most of the funds for the erection of the memorial. Friends of the Mayos all over the world, however, are being apprised of the proposed memorial and are being given the opportunity to contribute to the fund if they wish. Already a California committee has been formed, as well as many Minnesota committees.

The 1943 Minnesota legislature by a concurrent resolution of both houses created the Committee of Founders, charging them

with the task of planning and bringing into being a suitable memorial to the Mayo brothers. After many months of weighing the pros and cons of many projects suggested to perpetuate the Mayo memory, the Committee of Founders finally agreed that the most fitting memorial would be a great center for research to be erected on the campus of the medical school to which the Doctors Mayo had devoted so much time, interest and money during their lifetime.

Dr. Will Mayo served the University of Minnesota as a member of the board of regents for thirty-two years and Doctor Charlie was for many years professor of surgery. Together they were responsible for establishing the Mayo Foundation for Medical Education and Research for the two-fold purpose of developing better trained physicians and of carrying forward medical research to aid in the treatment and prevention of disease.

Among other facilities, the proposed Memorial will contain a memorial auditorium, research laboratories, conference rooms and offices for the clinical departments and the department of pathology, the operating rooms and major laboratories of the University hospital, and the administrative offices of the Med-

ical School, the School of Nursing, the University Hospital, and the department of postgraduate medical education.

The University of Minnesota Medical School has long needed such a building to provide essential and well coordinated physical facilities. Minnesota has one of the outstanding faculties in the country. Its members have made important contributions to surgery, particularly in the field of abdominal obstruction, to sulfonamide therapy, to the treatment of liver disease and in the field of pediatrics. Buildings do not make great universities, but modern buildings, well equipped, help great men to do great work.

By assembling under one roof the various departmental research laboratories, with ready access to classrooms, hospitals, the School of Public Health and the Medical School administration, the Mayo Memorial will create, in fact, a great medical center where research, the training of doctors, and the treatment of patients go forward hand in hand every minute of every day,—thus carrying on through many generations the work so nobly advanced by the Mayos.

The Committee of Founders visualizes the proposed memorial as contributing much to the general public, to industry, to practicing physicians, to nurses and to medical students.

Standards of medical, hospital and public health practice in any area are usually dependent upon the quality of medical education and medical research in the university or other teaching center serving that area. Minnesota's standards are high, largely because of its inheritance from the Mayos. Minnesota, moreover, has the only complete Medical School between Madison, Wisconsin, and the Pacific Northwest.

Construction of the Mayo Memorial, together with the new School of Public Health which is being planned for the University of Minnesota, will provide a center not only for the conduct of medical research but also for the application of the results of this research directly to the public health of this great area of twelve million people and thus, indirectly, to public health throughout the country. The Memorial will make it possible, for instance, to increase the effectiveness of the work the University is now doing on a number of projects directly applicable to industrial health and to provide special services of various kinds to industries of the state and the nation.

The Medical School at Minnesota has always stressed the importance of continuing postgraduate education for practicing physicians. For many years refresher courses have been offered regularly. The Mayo Memorial will provide improved facilities for these refresher courses and thus strengthen this important service to physicians. Then, too, it will play an important part in helping orient the thousands of doctors returning from military service to civilian practice at the end of the war.

Every woman who is studying to be a nurse has deep respect for the Doctors Mayo so it is particularly fitting that the University of Minnesota School of Nursing find the expanded facilities it needs in the Mayo Memorial so that the program of nursing education at Minnesota will be able to advance steadily in keeping with the times.

The expanded facilities provided by the Memorial will enable the medical student to maintain closer contact with laboratories, hospitals and instructors and thus widen his knowledge of medical techniques.

A detailed study of plans for the Mayo Memorial will show how architects, medical school faculty and Committee of Founders working together have created a building that will benefit every department of the Medical School. All floors from the basement to the fifth will connect with the present hospital buildings. Experimental surgery with air-conditioned animal quarters will be housed in the basement; the department of radiology on the second floor. The main floor will serve as the visitors entrance to the University Hospitals and will include the memorial auditorium, accommodating about 700 persons. The impressive foyer has been suggested as the ideal location for statues of Dr. Will and Dr. Charlie Mayo. Housed here also will be the administrative offices of the University Hospitals, the department of postgraduate medical education and the School of Nursing. The fourth floor will house the teaching and service laboratories of the University hospitals and offices and rooms for medical technology; the fifth, the department of pathology; the sixth and seventh, operating rooms, anesthesia rooms, laboratories, galleries and general offices of the department of surgery; eighth, department of obstetrics and gynecology; ninth, departments of ophthalmology, otolaryngology, and dermatology; tenth, laboratories, offices and conference rooms of the Department of Medicine; eleventh, neuropsychiatry; twelfth, department of pediatrics. The top floor of the Mayo Memorial tower will be devoted to the administrative offices of the Medical School, a campus office for the Mayo Foundation, a faculty room and a student and faculty lounge.

The Committee of Founders believes that all friends of the Doctors Mayo will wish to help make the Memorial a reality. The Committee also believes that there are many others who may not have known the Doctors Mayo personally, but who, knowing of their remarkable work, will desire to participate in this tribute. There will be still others who recognize in the Mayo Memorial an unusual opportunity to contribute to the advancement of public and industrial health.

It is hoped that the Minnesota state legislature, now in session, will appropriate \$1,000,000 for the Memorial. Bills authorizing such an appropriation contingent upon the contribution of another million from private sources, are now before both senate and house.

The remaining \$1,000,000 will be raised through voluntary contributions from individuals and corporations, according to the plans of the Committee of Founders. Committees now are being organized in the principal cities of Minnesota to make an appeal for such funds and it is hoped that similar committees will be organized in other metropolitan centers of the nation to inform citizens about the Memorial and to help in furthering the appeal for funds.

At present the Committee of Founders, through its state headquarters, is beginning its appeal to individuals and corporations for gifts. The appeal will continue through the winter and spring, culminating, according to present plans, with a public appeal to Minnesota citizens in the early summer. It is hoped to complete the appeal for funds by mid-summer so that as soon as war conditions permit, the memorial building may be erected and the research and training that will perpetuate the memory of the Mayos through the generations, may begin to make use of these expanded facilities.

(Continued from page 126)

Dr. Nelson K. Hopkins, veteran doctor of Arlington, South Dakota, is retiring from practice by reason of declining health. He had been in service in Brookings county for 36 years.

Dr. Archie D. McCannel of Minot, North Dakota, discussed prepaid medical insurance for low income groups at a January meeting of the Rotary club of Minot.

Dr. Alexander C. McDonald, Valley City, North Dakota, has been appointed a member of the Barnes county insanity board.

Dr. R. S. Hegge of Austin, Minnesota, has been named health officer of Mower county.

Dr. Roland F. Mueller, Two Harbors, Minnesota, was appointed county health officer.

Dr. Erhart E. Zemke, Truman, Minnesota, captain in the army medical corps reserve, has received a medical discharge and will resume practice at Fairmont.

Dr. Phillip E. Griffin was named president of the Yellowstone Valley medical society at its annual meeting December 29, Billings, Montana. Other officers chosen were: Dr. Harry O. Drew, vice president; Dr. H. T. Caraway, secretary; Dr. A. E. Stripp, treasurer. Dr. W. G. Richards read a paper on Pulmonary Embolism.

Dr. Miguel Drobinsky was elected president at the Third District medical society meeting held on December 14 at Estelline, S. D. Other officers for the year are: Dr. G. H. Gulbrandsen, Brookings, vice president; Dr. C. M. Kershner, Brookings, secretary-treasurer.

Dr. J. M. Butler, Hot Springs, South Dakota, was elected president of the South Dakota Public Health association at its closing meeting at Huron November 13. Other officers elected were: Dr. Clarence E. Sherwood, Madison, vice president, and Dr. Gilbert Cottam, Pierre, director of the state board of health.

Dr. C. W. Millard has left Lake Andes, South Dakota, to take up residence and practice in Marietta, Ohio. His departure leaves the town with no physician and no positive assurance of procuring one in the immediate future.

Dr. W. T. Ferris of Chamberlin, South Dakota, has been released from active duty as lieutenant commander of the naval reserve and reopened offices in Chamberlin.

Dr. O. B. Fesenmaier of Hanska, Minnesota, after attempting to get into the Army in 1942, into the Navy in 1944, and to enlist in the Army Medical corps, has again been informed that he is disqualified on account of physical requirements. Hanska profits, for it will thus be able to retain its doctor who has served it for the past two years.

Dr. J. Arnold Bolz, a native of Elgin, Illinois, has recently come to Grand Rapids, Minnesota, and is now associated with the Itasca Clinic. A member of the U. S. Naval reserve he has been honorably discharged for medical reasons.

Newly Elected Hospital Chiefs of Staff

In Minneapolis: at Eitel Hospital, Dr. Wm. R. Jones; at Northwestern, Dr. Wm. H. Rucker; St. Barnabas, Dr. C. O. Rice; Swedish, Dr. Malcolm C. Pfunder. St. James Hospital, Butte, Montana, Dr. Patrick E. Kane; Luther Hospital, Watertown, South Dakota, Dr. H. Russell Brown. At Duluth: St. Luke's Hospital, Dr. Orval L. McHaffie; Miller Memorial, Dr. Anthony J. Søang; St. Mary's, Dr. John R. McNutt. St. Joseph's Hospital, Brainerd, Minnesota, Dr. Milo P. Gerber; St. Joseph's, St. Paul, Minnesota, Dr. Harold R. Tregilgas.

American Student Health Association News-Letter

The health department of Stout Institute, Woodville, Wisconsin, is now being represented by Dr. Geo. Bryant, college physician, and Delma M. Proudlock, college nurse.

Dr. J. J. Lawless succeeded Dr. J. E. Andes as director of the health service at West Virginia University, Morgantown, Dr. Andes having removed to Pulaski, Virginia.

Dr. Marie Baldwin has gone from the Mississippi State College for Women to Duke University Hospital.

Change in staff of the health service at Keuka College, Keuka Park, N. Y.: college physician, Robt. F. Lewis, M.D., college nurse, Miss Janet Jordan.

Dr. Luther A. Tarbell has succeeded Dr. W. C. Thompson as director of student health at Oklahoma A & M College, Stillwater, Okla.

Dr. Leonard M. Folkers is now chairman of the division of health education at Stephens College, Columbia, Missouri, succeeding Dr. Florence I. Mahoney, who has gone to the University of Wisconsin, Madison.

Dr. Fred J. Wampler has resigned as director of student health at the Medical College of Virginia to take up his duties as medical director of the Rustless Iron and Steel Corporation in Baltimore, Maryland. The new student health physician at the Medical College of Virginia is Dr. R. W. Miller.

To Members of the American Student Health Association:

For the third time since the beginning of the war the American Student Health Association will be obliged to cancel the Annual Meeting, planned for May 2 and 3.

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Although we all are closely associated in the promotion of the war training program through participation in the AST and V-12 programs, none of us would state that the duration of the war would be materially lessened if we held an annual meeting. Thus, in cancelling our projected meeting, we are acting in good faith on the request of the Office of Defense Transportation to eliminate all but essential travel.

President Canuteson says: "In spite of no meeting, we must do our utmost to maintain the progress that has been made in the past 25 years in the improvement and promotion of health of college students. We need increased interest in the fundamentals of a balanced health program. No part of the entire program can substitute for the balanced program of health service, health education and physical education. In the flush of war psychology many individuals who should have broader perspective are centering the entire college health program on sports and physical education. None of us will belittle the importance of physical exercise in improving skills in sports or in general maintenance of good health; neither can any of us overlook the basic causes of poor health and physical disability so graphically illustrated by causes of rejection of men for military duty."

Necrology

Dr. Andrew J. Hunter, Eureka, Montana, 93, died January 26. He was a graduate of the Hahnemann Medical College and had lived in Montana since 1912.

Dr. Wm. E. Dickinson, 67, Canistota, South Dakota, died February 1. He received his medical degree at the University of Illinois.

Dr. Stanley Earl Patterson, 44, Mandan, North Dakota, a graduate of the University of Manitoba, Winnipeg, Faculty of Medicine, died at Mandan February 6.

Dr. Fred C. Soper, 64, seven years coroner of Clay county, Minnesota, and residing at Dilworth, Minnesota, died February 7 in Fargo hospital.

Dr. William P. Roberts, 75, Sioux Falls, South Dakota, who practiced in that city from 1904 until 1942, died January 12 following an illness of several months.

Dr. Thorvald Petersen, 64, Minneapolis, brother of a former Minnesota governor and a practitioner in Minneapolis for more than thirty years, died January 22.

Dr. Thos. P. Rothnem, 61, Fargo, North Dakota, died Friday, January 19, at his home. Dr. Rothnem was x-ray specialist at St. Luke's hospital and Fargo clinic.

Dr. Marion M. Hursh, 67, Grand Rapids, Minnesota, died January 20 following a lingering illness. A native of Minnesota he had practiced also in Cohasset and Hibbing and some years ago was credited with having ushered more than 3,000 babies into the world in Itasca county alone.

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for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory, in new office building located in very best residential retail section. Address Box 761A, care of this office.

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University of Minnesota Medical School

The regents of the University of Minnesota recently unanimously approved an agreement which creates the "Frederick B. Wells, Jr., Trust Fund." The income from this fund will be paid the university in perpetuity in the amount of approximately \$2,400 annually. The purpose of this fund is to support the investigation and better treatment of dementia praecox and allied conditions. Expenditures are to be made at the discretion of the dean of the medical school and the head of the department of neuropsychiatry.

Also established at the University of Minnesota was the J. B. Johnston Lectureship in Neurology through a gift from his widow, Mrs. J. B. Johnston of Los Altos, California. This lectureship is in honor of the late Dean J. B. Johnston, professor of comparative neurology in the medical school from 1908 to 1915, and dean of the college of science, literature and the arts from 1916 to 1937. It is the hope of the committee to invite to the medical school annually outstanding neurologists who will present this lecture.

Another announcement of interest is the Leo G. Rigler Lectureship in Radiology. A group of friends and colleagues of Dr. Rigler, professor and head of the department of radiology, have tendered a gift to the university to endow this lectureship. This annual lectureship is established as an expression of esteem, and in appreciation of the contributions which Dr. Rigler has made to the teaching and practice of medicine, particularly in the field of radiology.



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An extensive bibliography reports the results of the administration of more than 8000 injections of Tetrathione (Searle). Most prominent among the indications for Tetrathione (Searle) are Buerger's disease (thromboangiitis obliterans), Raynaud's disease and scleroderma.

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Vi-Syneral, original vitamin-mineral preparation, now contains an average of 40 per cent more of important vitamin B₁, B₂, niacinamide, calcium pantothenate, ascorbic acid, and alpha-tocopherol (vitamin E). This rise in potency is in line with the company's pioneering and investigations in multiple vitamin-mineral therapy and with newer clinical research on vitamin requirements. It applies to all five Funk-Dubin balanced potencies, (1) Infants and Children (to age 6), (2) Children and Adolescents (age 6 to 16), (3) Adults, (4) expectant and nursing mothers, (5) special group (for middle-aged and aged). Vi-Syneral is well known as a multiple vitamin-mineral supplement to the average diet, for helping to ward off nutritional deficiencies, or as an adjunct to other specific treatment. Besides all the vitamins now known to be necessary to human nutrition, Vi-Syneral also furnishes eight minerals: calcium, phosphorus, iron, iodine, copper, manganese, magnesium and zinc.

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for the best art works by physicians, memorializing the medical profession's "Courage and Devotion Beyond the Call of Duty" (in war and in peace).

This prize contest is open to any physician member of the American Physicians Art Association, including medical officers in the armed forces of the United States and Canada.

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Small Film Radiography in Industrial Groups

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ON the basis of the decline in the mortality of tuberculosis in the United States—the crude rate in 1940 was one quarter of the rate in 1900—several workers have intimated that tuberculosis is no longer a serious problem and have viewed the situation with complacency. However, even a casual perusal of the mortality and morbidity tables will quickly demonstrate to the critical observer that tuberculosis remains in the foreground as a public health problem. Approximately 60,000 tuberculosis deaths were reported yearly by state health departments in the five-year period, 1939 to 1943. Furthermore, tuberculosis is the principal cause of death of persons 15 to 35 years of age. In the age group, 20 to 34 years, one in every six deaths in the white population and one in every three deaths in the colored are due to tuberculosis.

Industrialization appears to be assuming a prominent role as a causal factor of high tuberculosis mortality rates. In 1939 to 1941 these rates were higher in cities than in

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rural areas for all age groups, and for all races. It is interesting, however, that whereas tuberculosis mortality increased with increasing size of community for adult males of both white and colored extraction, it decreased for adult white females, and remained practically the same in communities of all sizes for adult negro females.

During the present war emergency, special problems have appeared to demonstrate again the close relationship between war and tuberculosis. The rate of decline, which in the years just prior to World War II had become quite rapid, is for the first time in two decades beginning to decrease. Indeed, in several large industrial areas, tuberculosis mortality rates have actually increased. During the period 1939 to 1943, an average of 110,000 new cases of tuberculosis have been reported to state and local health departments annually. In the surveys made by the Public Health Service most of the newly discovered cases were not known to local health officials. Accordingly, the number of hidden cases must be up in the hundreds of thousands.

On December 12, 1930, while holding a tuberculosis clinic in Little Falls, Minnesota, Drs. E. J. Simons and H. E. Hilleboe revealed some splendid tuberculosis work they were conducting as general practitioners in the village of Swanville. Their program consisted of administering the tuberculin test to large numbers of apparently healthy people, making x-ray films of the chests of the reactors and applying various differential diagnostic procedures to those who presented x-ray shadows. This was an ideal program and they were immediately invited to present their work before the regular meeting of the Lymanhurst Medical Staff in Minneapolis on January 27, 1931. Their presentation was so excellent and described tuberculosis control measures so far in advance of any other community that the manuscript

was requested for publication in the JOURNAL-LANCET, where it appeared on April 1, 1931. This was the first article either of these authors had published on tuberculosis. Their vision of the control of this disease was so clearly expressed that they were immediately in demand as speakers and writers. Numerous subsequent articles by them were published in the JOURNAL-LANCET. We are pleased to present here the first of Dr. Hilleboe's papers that we have published since he became medical director of the Tuberculosis Control Division of the United States Public Health Service. The JOURNAL-LANCET takes great pride in the fine accomplishments of Simons and Hilleboe in the field of tuberculosis during the past fifteen years and desires to continue its support of their activities.—(J.A.M., Ed.)

The first step in the preparation of a decisive attack against tuberculosis is a careful and comprehensive evaluation of the extent and nature of the problem in each community. This should be done by reviewing the age, sex, color and geographic distributions, and the economic status of the population. These data should then be considered in connection with the community's morbidity and mortality rates for tuberculosis (before reliance is placed on these figures, the completeness and accuracy of the local vital statistics should be investigated). Detailed analyses of reliable morbidity and mortality data will quickly indicate the magnitude of the problem and clearly establish those groups most seriously affected and urgently in need of concentrated attention. Spot maps of infectious cases not isolated in hospitals and sanatoria will also be helpful in denoting the known centers of contagion, where immediate action is imperative.

After the tuberculosis problem has been defined as completely as possible, careful inventory, both qualitative and quantitative, must be made of the facilities and resources being utilized for tuberculosis control in the community. With exact knowledge of the extent of the problem, including both what is, and what is not being done, it is possible to prepare a specific plan of control. An effective program of tuberculosis control should embrace four principal phases: 1) case-finding, 2) medical care and isolation, 3) after-care and rehabilitation, and 4) protection of the tuberculous family against economic distress. A program which includes these public health measures, supported by research and well-planned health education in each field of endeavor, will be certain to reduce the morbidity and mortality from tuberculosis.

In order to produce significant results, case-finding efforts should be directed toward those groups of the population where a high prevalence of disease is suspected and where large numbers of the people can be reached quickly and economically. Until recent years case-finding efforts were centered primarily among the family members of known infectious patients. Since tuberculosis is basically a family epidemic, a high yield of new cases was obtained by this approach. However, limited field-nursing services and clinical facilities have greatly restricted the program except in those few communities with well developed and ample health services. Moreover, there are many tuberculous families scattered through the population in which the disease is completely unsuspected. Therefore it has been necessary to supplement and complement these family epidemiological studies with other case-finding procedures.

Since the introduction of mass radiography, case-finding has been directed on an extensive scale to large population groups without reference to specific foci of infection. This type of program has been so satisfactory that many physicians have advocated that the entire population be examined radiographically at regular intervals. Such a scheme, however, is rather difficult, and furthermore, does not appear to be essential for the control of tuberculosis. As in the control of other communicable diseases it is probably necessary only to reach a significant proportion of the population within a limited period of time.

There are two sizable segments of the population which may be easily reached by mass radiography. These include: 1) persons admitted to general hospitals, and 2) persons employed in the large and small industries of the nation.

Small film radiography is well suited to case-finding in general hospitals. No expense is entailed in assembling the people for study. In addition, film interpretation may be done by the staff of the department of roentgenology. Furthermore, facilities are already available for completing clinical examinations and providing care and treatment for ambulatory patients.

The procedure also provides several valuable by-products. Increased accuracy in the clinical diagnosis of chest disease is obtained. Non-tuberculous disease is detected more quickly than before. Finally, and of particular importance, employees and nurses in contact with patients are spared unnecessary exposure to those who have tuberculosis in a communicable stage.

It is hoped that soon all general hospitals will provide routine x-ray examinations of the chest just as they now are making routine serologic tests for syphilis. In 1943, over 15 million persons,¹ not including out-patients, were admitted to general hospitals in the United States for care and treatment. The newly discovered cases of tuberculosis found among these patients can logically become the centers from which many other cases can be revealed. By including chest x-ray examinations of all hospital employees also, a large industrial population is easily reached with considerable benefit both to the hospital and to the individual employee.

Hospitals which care for the mentally ill are ideal centers in which to develop mass radiographic methods. In the United States nearly 500,000 patients are currently hospitalized in these institutions. Chest surveys conducted in Minnesota, New York, and Illinois have shown that from 4 per cent to 10 per cent of these patients have x-ray evidence of reinfection tuberculosis. These people are not only likely to infect fellow patients and the institutional members with whom they come in contact but also can disseminate their disease to the general population when released from care.

The second population group in which mass radiographic procedures may be profitably conducted consists of the millions of industrial workers. From 1942 to 1944 over one million workers in the United States were examined by eight transportable field units (35 mm. and 4 x 5 inch) of the United States Public Health Service. In this group of adults, 1.5 per cent had x-ray evidence of reinfection type tuberculosis of which approximately 65 per cent were minimal, 30 per cent moderately advanced, and 5 per cent far advanced according to the classification of the National Tuberculosis Association. This distribution is of considerable interest in view of the fact that minimal cases have comprised only 10 to 15 per cent of the first admissions to tuberculosis hospitals in this country in recent years.

In the course of mass x-ray surveys in industry, a number of chest conditions other than tuberculosis were encountered. The discovery of non-tuberculosis pathology forms a valuable by-product of this work. Gould² of

the U. S. Public Health Service made a study of non-tuberculosis lesions found among 442,252 chest films of a selected group of apparently normal persons working in large industries, principally shipyards and government-owned arsenals and depots. The group surveyed must not be considered as a representative sample of the adult population. The results, however, do give some indication of the non-tuberculosis chest pathology one may find by routine 35 mm. and 4"x5" mass radiography. All diagnoses were based upon 14"x17" confirmatory celluloid films taken on persons with abnormal or suspicious small films.

The analysis of this selected group of 442,252 films revealed 4,982 (or 1.1 per cent) with evidence of non-tuberculosis chest pathology; sixty-six different categories of chest lesions were listed. It is interesting to note just a few of the more common findings; abnormal hearts, 2,652 (1 in 167), pneumoconiosis 261 (1 in 1700) suspected bronchiectasis 252 (1 in 1800), mediastinal mass 52 (1 in 8500), dextracardia 40 (1 in 11,100). Several uncommon cases were discovered also, including: dermoid cyst, 5 cases; calcification of pericardium, 3 cases; echinococcus cyst of the heart, 1 case (confirmed clinically).

The majority of individuals with these non-tuberculosis lesions were unaware of their disease. It was surprising to note how extensive some of these chest lesions had become without producing symptoms sufficient to cause the individual to seek medical advice. It was gratifying to detect numerous chest tumors in early and remediable stages, when modern surgical measures could be successfully employed. Thus, the by-products become nearly as valuable as the main objective, in mass radiography of the chest.

The choice of small film equipment for a particular industrial chest survey must be based upon careful consideration of the extent of the anticipated yearly load, personnel obtainable, funds available and specific objectives in each proposed application.³ It is important to have an experienced professional person survey each situation before equipment is purchased or a program started.

The operation of photofluorographic equipment has been markedly facilitated by the development of two automatic devices, the photo-electric timing mechanism (Morgan phototimer) and the roll film automatic camera. These instruments simplify the photofluorographic process so that the operator is required merely to place the subject before the x-ray machine and to close the exposure switch. Time-wasting measurements of the thickness of the chest of each subject and arithmetical calculation of the milliamperage, kilo-voltage, and time are entirely eliminated.

The photo-electric timing mechanism controls electronically the length of exposure by measuring the amount of light on the fluorescent screen. The brilliance of this screen is directly proportional to the amount of radiation coming through the subject being examined. With this automatic control wide variations in types of x-ray equipment are permissible regardless of the thickness of the chest.

For several years the belief has prevailed that roentgenograms of the chest must be made with exposure times of 0.1 second or less to prevent cardiac motion from reducing the clarity of the various intra-thoracic x-ray images. Morgan's investigations³ of cardiac motion by kymographic methods indicate that these ideas are far from valid. It appears that reorganization of our thinking on this subject is in order. It is apparent from these studies that the detail of the roentgen images of pulmonary structures is not significantly impaired by long exposure times.

Since reasonably long exposure times do not impair radiographic quality, and exposure can be exactly determined even with electrical sources of uneven output, the whole picture of mass radiography changes. A low-powered self-rectified x-ray unit can now be utilized where the number of subjects to be examined is not too large and operating conditions are not severe. As a matter of fact, the Tuberculosis Control Division has had a complete unit costing less than \$3,000 in rather continuous experimental operation with satisfactory results.

The frequently debated question of the relative diagnostic accuracy of different sized x-ray films is now well on the way to a definite solution. The problem has been resolved into its component parts—first, limitations due to physical characteristics of the films and equipment, second, variations due to extrinsic factors which are the human errors made by the interpreters themselves, and third, the lack of uniformity in the classification of significant x-ray shadows presumably characteristic of pulmonary tuberculosis.

Comparative studies made during the period 1939 to 1943 have become of little value already, because of the striking advances that have been made in radiographic quality of all types of small films, 35 mm., 70 mm., and 4"x5".

On the basis of controlled studies made in 1944 on the physical characteristics of 35 mm., 4"x5", and 14"x17" sensitized paper and 14"x17" celluloid films, it appears that all of the different sized films are capable of detecting pathology of the density commonly seen in parenchymal infiltrations of a tuberculous nature if the roentgen image of the lesion is over 0.5 cm. in diameter. Studies are now going forward to determine variations in the so-called extrinsic factors. Present indications are that these human errors are of considerable magnitude even among highly skilled interpreters, regardless of what size of film is used.

There is such a tremendous task to perform in case-finding in the whole country that the policy of the U. S. Public Health Service has been to recommend the use of every known method of roentgenographic examination, provided high quality films are produced and expert interpreters are employed. These two requirements are basic and paramount and must be maintained in industrial surveys, despite the temptation to sacrifice quality to sheer quantity and speed.

As pointed out previously, it is essential to examine all present employees and all new employees and to make periodic examinations at reasonable intervals of the entire

working force of an industry in order to discover and control new cases as early as possible. Careful clinical study will then provide a sound medical basis for the immediate and ultimate disposition of each person suspected of having pulmonary tuberculosis. Depending on the extent of the lesion, presence or absence of activity and work capacity of the individual, definite placement plans can be made for continued employment under medical supervision or interruption of work if isolation and treatment are indicated.

Care must be exercised in the diagnosis of minimal lesions and the determination of their activity. Many employees have been penalized unnecessarily because of hasty conclusions drawn from the interpretation of a single flat plate of the chest. The more one sees of so-called minimal lesions on x-ray films, the more cautious one becomes in their interpretation. It has been found that competent readers often differ in their impressions of the activity of a lesion on a particular film. Indeed, it is true that a reader will not always make the same conclusion in interpreting the same film on two different occasions. The only safe rule to follow is careful clinical study, including examination by gastric lavage and tuberculin tests if indicated, before differential or final diagnosis is made. It may be necessary often to wait three to six months for comparative clinical study and examination of serial x-ray films before a definite diagnosis or determination of activity can be made.

Effective tuberculosis control, especially in industrial groups, requires a sound program of rehabilitation. Industry and the community must accept this responsibility jointly. Temporary and permanent sheltered employment will be necessary. The English have demonstrated the effectiveness of practical measures such as the industrial colony, the training colony, and the local workshop. This aspect of the tuberculosis problem presents many difficulties, but these can be overcome if full use is made of our tremendous and varied resources.

Because the problem is social and economic as well as medical, and requires the aid of all community groups for successful solution, other groups besides the medical profession are sooner or later drawn into the picture. The wisest plan is to enlist the aid of such groups from the beginning. Sharing in the planning of a program will result in a sharing in responsibility for its success as well. The local sanatoria, the voluntary tuberculosis association, welfare agencies, management, labor, and rehabilitation groups have definite contributions to make, and can render invaluable aid to the health department and private physicians. The industrial group is only one part of the population, and should be given consideration in direct proportion to the extent of its problem as it touches the community as a whole.

Financial security for the tuberculous person who is hospitalized or whose employment is limited, has come to be a responsibility the public must accept, if control of the disease is the goal of the community. Over-crowded living conditions, poor home hygiene, and fear of want during the absence of the breadwinner from the home all contribute to failures of arrest of the disease in individual cases. Lack of attention to these social and eco-

nomic factors results in the continued spread of the disease from uncontrolled open cases.

Psychological and economic adjustments often present greater problems than does the medical treatment. A comprehensive scheme is needed to satisfy all these elements. Financial grants should be available to patients and their families during the periods of treatment, after-care, and rehabilitation. These may need to be extended over long periods of invalidism or indefinitely in cases of permanent disability. Children must be properly cared for when the mother must leave the home to enter the sanatorium. Without these social and economic safeguards, the best medical program for tuberculosis control in the community will languish, and its cost will mount.

In addition to mass radiography, several other methods are available for case-finding, and full use should be made of all of them. Carefully taken histories and physical examinations are useful in the detection of new cases having subjective symptoms or objective findings; unfortunately, however, in the early stages of pulmonary tuberculosis both symptoms and physical findings are usually absent or escape notice.

The routine use of the tuberculin test in the office of the private physician is a useful method of finding infected persons. Chest x-ray examinations of the positive reactors separate those in need of clinical study from those who do not require such study. This method is particularly effective in the preliminary screening of household associates of infectious cases in rural areas. If the interest of the thousands of rural physicians can be aroused and translated into action, an important part of the population can be examined with gratifying results. In those areas, the family physician is usually the first to see the tuberculous individual and the one to whom the patient is returned after sanatorium care. The family physician who is conscious of the unseen presence of tuberculosis and who suspects and properly examines every one entering his office will uncover surprisingly large numbers of new cases.

Following the chance occurrence of two juvenile cases of tuberculous meningitis in a small community of 450 persons in rural Minnesota, and the attendant interest aroused by the parents, Simons and Hilleboe⁴ discovered 19 cases of reinfection tuberculosis in the community and the surrounding district in the following nine months. This was largely the result of routine tuberculin testing and x-ray examination of positive reactors of the patients coming into the office, regardless of complaint. Every private physician in the country can repeat this experience if he will apply diligently the simple methods available to him.

It is recognized that tuberculin-testing surveys among school children have great educational value. They are disappointing, however, as a means of finding considerable numbers of infectious cases and the cost per case discovered is excessively high. It is better to concentrate those same efforts on the tuberculin testing of the family and other contacts of known cases. Tuberculin testing is similarly unsatisfactory for the examination of adult groups in which the incidence of positive reactors is high

(e. g. persons in large industries). Little is gained by such testing prior to x-ray examination and valuable time is lost by repeated interruptions of work.

The laboratory demonstration of tubercle bacilli continues to be the most exact method of diagnosis of tuberculosis. Unfortunately, many people with hidden tuberculosis do not raise sputum. In recent years, the examination of the fasting stomach contents obtained by simple gastric lavage has been employed extensively for the detection of virulent acid-fast organisms. This technic is especially useful with persons having minimal lesions but no expectoration. Laryngeal swabs have been used for the detection of tubercle bacilli in Europe but have not been well accepted or used extensively in this country.

The practicing physician will do well to request routine laboratory examinations of the sputum of each of his patients with pulmonary symptoms. A number of these persons will be found to have tuberculosis. Most states provide free laboratory service for such tests.

When funds for tuberculosis control are limited in a given community, great care must be exercised in the choice of case-finding procedures. Those methods should be selected which will reach the greatest number of people in the shortest possible time within the limits of available facilities and personnel. It is interesting to note the comparative results obtained at identical cost by small and large film methods in mass case-finding. It is conservatively estimated that 100,000 persons can be examined by 35 mm. or 70 mm. photofluorography at the same cost as that for the examination of 10,000 or 20,000 persons by 14 x 17-inch roentgenography. It may be argued that several minimal cases of tuberculosis will be overlooked by the former technics. However, even if these methods of mass radiography fail to detect 15 per cent of these lesions, they will still uncover a considerably greater number of cases than the large film technic, due to their inherent economy. Ten thousand 14 x 17 inch celluloid films taken at the same total cost as 100,000 35 mm. films, even under the most favorable conditions, detect a total of only 329 cases of reinfection-type tuberculosis in all stages of the disease, as compared with 1,500 cases by the small film method. (If 1.5 per cent of those examined have reinfection tuberculosis, 65 per cent minimal, 30 per cent moderately advanced and 5 per cent far advanced). The latter technic detects five times as many moderately and far advanced cases as well as an additional 751 minimal cases. The evaluation of the case-finding methods to be used in tuberculosis control must take into consideration quantitative as well as qualitative factors.

In order to achieve the four principal objectives of tuberculosis control great assistance can be given by a carefully planned program of research in each of the

fields of operation. Careful studies and investigations are indicated in the evaluation of present-day public health methods. Frequent inventories must be taken by state and local health departments to determine whether or not measures employed are actually decreasing mortality from the disease.

The application of new technical developments in mass radiography should greatly simplify the problem of case-finding among the population groups now difficult to reach. Mass radiography will make possible the epidemiological investigation of entire communities where only a small number of families could be studied before. This will give the epidemiologist an opportunity to study fundamental relationships on an extensive scale in the evolution of pulmonary tuberculosis.

An intensive search must be made for chemo-therapeutic and biologic agents to prevent the disease or to increase an individual's resistance to tubercle bacilli. When a drug or biologic product which will destroy tubercle bacilli in the human body is found, immediate efforts should be made to use the new agent prophylactically, before irreversible pathological processes have developed. Infected household contacts of known infectious cases or nurses exposed to unsuspected tuberculous patients in general hospitals would offer fertile fields for a broad program of prevention of pulmonary tuberculosis.

Careful studies of social and economic problems in the field of after-care and rehabilitation are also needed. Among these an evaluation of the economic loss due to tuberculosis in the family and community is indicated. On the basis of such an investigation the social security laws may be amended to protect the tuberculous family against loss of wages.

These are only a few of the urgent problems that must be solved before tuberculosis is brought under control. Scientific research must proceed hand in hand with public health services on a broad scale.

If tuberculosis is to be eradicated, it is essential that the rate at which infectious cases develop in the population be maintained permanently below the rate at which infectious cases are isolated and prevented from spreading the disease. Furthermore, the greater the disparity in the two rates, the more quickly will this eradication be achieved. These fundamental principles, pointed out by Frost, must be constantly borne in mind in the planning and execution of every tuberculosis control program in every community, if success is to be attained.

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Forty to fifty tons of medical supplies are being sent by the Red Cross each month to China. These shipments have been made up largely of late of sulfa drugs and have been flown immediately into an area where there had been outbreaks of plague. Medical shipments are sent to Calcutta, shipped overland to the Assam airfields and from there into China.

Miliary Tuberculosis vs. Typhoid Fever*

Case Reports

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THE differential diagnosis of miliary tuberculosis and typhoid fever is an old and often difficult problem in clinical medicine. The following two cases are illustrative of the striking similarity which may be presented by the clinical signs and symptoms of these two diseases. While the laboratory, through agglutination titers and cultures of blood, urine and feces may easily identify the typhoid infection, miliary tuberculosis often masquerades behind negative chest x-rays, negative smears and cultures, to be diagnosed only at postmortem table. A technic which may be of great value in pre-mortem diagnosis of the latter is discussed in an editorial in this issue.

Case No. 3755-A. The case was that of a 44-year-old male negro who was admitted to the Minneapolis General Hospital on May 30, 1944, stating that he felt well until noon of the day of admission, at which time he was seized with a sudden severe chill, followed by a feeling of feverishness, pain in the lumbar region, and a "catch-in" pain in the right lower chest anteriorly. Close questioning, however, revealed that for several weeks the patient had suffered malaise, anorexia and weakness, with some weight loss. These symptoms necessitated quitting his job as a janitor. There had been no known exposure to contagious diseases.

Physical examination revealed the blood pressure was 170/110, pulse was 108 and regular, temperature was 105.6, and respirations were 28. The patient was rational and had no apparent respiratory distress. Positive physical findings were limited to left ventricular enlargement of the heart and crackling rales, high-pitched breath tones, and increased tactile fremitus in a small area of the right lower chest anteriorly. Chest x-rays taken on admission showed evidence of cardiac hypertrophy, left ventricular type, but were negative for abnormal pulmonary shadows. He did not react to tuberculin.

Laboratory examinations showed negative serology; hemoglobin was 93 per cent; white blood cell count was 5600 with 86 per cent polymorphonuclears. The white blood cell count later ranged from 2600 to 3300 with a similar differential. Urine showed a faint trace of albumin. Blood cultures on admission, and drawn daily thereafter, were consistently negative, as were urine and feces cultures also. Agglutination test for typhoid and paratyphoid, brucellosis and typhus were reported negative on the second and ninth hospital days. Examination of spinal fluid was essentially negative.

During his hospital stay, the patient's temperature ranged from 103 to 106 daily.[‡] The patient grew progressively weaker. On the tenth hospital day, he became irrational and developed left heart failure. X-rays of the chest taken at this time were reported showing sev-

eral small patchy areas of bronchopneumonia. The sputum typed out pneumococcus type 21. The patient was digitalized and started on sulfadiazine, but did not respond to therapy and expired on June 11, 1944. Sternal aspiration was done immediately after death. Numerous miliary tubercles were present in the "marrow units." Postmortem revealed: 1) Generalized miliary tuberculosis involving the lungs, liver, spleen, kidneys, adrenals, esophagus and periaortic lymph nodes; 2) caseous tuberculosis of the bronchial lymph nodes.

Case No. 3610-A. This is the case of a 23-year-old female negro who was admitted to the Minneapolis General Hospital on May 23, 1944, with the complaints that two weeks prior to admission she had developed a cold and cough associated with headache, anorexia, marked in the substernal region. There was aching in the knees and shoulders and the patient had had several episodes of epistaxis. Three days before admission the patient developed chills, fever, and marked diaphoresis. Nausea was present but vomiting occurred only after self-medication. Past history revealed the patient had been treated for acute gonorrhea six months previously and had been closely followed by there was no evidence of recurrence. There was no history of exposure to tuberculosis or other contagious diseases. The patient had not traveled from Minneapolis recently.

Physical examination revealed the blood pressure to be 106/60, temperature was 103.6, pulse 85, regular, and respirations 20. The patient was a well-developed young negress who was rational, but appeared acutely ill. There was three-plus enlargement of the pharyngeal tonsils and slight injection of the posterior pharynx. Despite careful examination, no other abnormal physical findings were elicited. Chest x-rays showed slightly increased basilar markings but no evidence of infiltration or consolidation was seen. There was no reaction to tuberculin.

Laboratory examinations revealed negative serology, hemoglobin was 79 per cent and no evidence of sickling of the red blood cells. The white blood cell count was 5600 with 82 per cent polymorphonuclears. The urine was negative. Blood cultures drawn on two successive days showed gram-negative rods. These later were agglutinated with typhoid serum in dilution of 1:12800, a significant titer. Agglutination tests on May 25th and May 26th were positive for typhoid in a titer of 1:80. On May 29th the titer rose to 1:1280. Typhoid bacilli were also isolated from the feces. The patient's daughter was also admitted to the Minneapolis General Hospital a few days after the mother's entrance, with a very similar clinical picture. A diagnosis of typhoid fever was also made on the daughter. The father was subsequently shown to be a typhoid carrier. The patient was given supportive treatment; she had an uneventful recovery and left the hospital forty-one days following admission.

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† The second day the patient developed a moderately severe watery diarrhea which persisted during his hospital stay.

The Tuberculin Test and Health Education

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WISCONSIN'S leadership in the fight against tuberculosis is due in no small part to the tuberculin test, and the health education preceding and accompanying the test.

The Wisconsin Anti-Tuberculosis Association began this work in a modest way in 1927, using the Von Pirquet test. In 1930 two child-caring institutions were studied with the Mantoux test. In 1931 a clinic was held in one of the state teachers' colleges, using the Mantoux, in which some 400 students and most of the faculty members were tested. Reactors were x-rayed. Among those found with secondary infection of the lung was a member of the graduating class with far-advanced pulmonary tuberculosis and positive sputum. This clinic was held shortly before the close of the school year, and this young man received his diploma in June and died of pulmonary tuberculosis in September.

The publicity given to this case led to a request for a similar clinic in a high school from the superintendent of schools of the city in which the teachers' college was located. This high school clinic was held immediately after the opening of school in September. Nearly a thousand students and some 65 teachers were given the intradermal test after considerable educational work had been done in the high school. The nature, cause, and danger of pulmonary tuberculosis and the significance of the tuberculin reaction were explained to teachers and pupils in lectures and leaflets. During the preliminary educational work, a special meeting of the school board was held and a resolution was unanimously passed stating that any teacher who failed to take the test should not be surprised if a contract for the following year was not offered. One hundred per cent of the teachers and more than 90 per cent of the students responded. On x-ray, four cases of secondary infection of the lungs with suspicious clinical tuberculosis were diagnosed among the students. No case of suspicious clinical tuberculosis was found among the teachers, although several showed evidence of healed secondary infection.

The four students were advised to have immediate sanatorium treatment. Three of the students entered a sanatorium within a few weeks. The fourth, because of religious prejudice on the part of the mother, was not permitted to take sanatorium treatment. She was excluded from school and numerous unsuccessful attempts were made by the public health nurse of the city to induce the mother to change her mind and permit the girl to enter a sanatorium. At the end of six months, the girl had lost some fifteen pounds in weight and had a productive cough with profuse expectoration. Still the mother would not yield to urgent entreaties on the part of teachers and nurses. Finally, the girl was sent to Chicago and placed under the supervision of a distant relative who was an irregular practitioner. She died a few months later. The three schoolmates who accepted sana-

torium treatment all recovered and have continued well up to the present time.

It is interesting to note that a similar clinic has been held in this high school in a city of 15,000 inhabitants annually since the first one was held in the fall of 1931.

Since 1931 similar clinics have been carried on widely in other Wisconsin high schools. Up to the present time, close to 140,000 individuals have been tuberculin tested by the medical department of the Wisconsin Anti-Tuberculosis Association. Not all of those receiving the test were high school students. Sometimes the public health nurse brought in grade pupils from families who had had a death from tuberculosis or a member of the family in the sanatorium. In many cases where two or more children of one family were found to be reactors, the parents or older brothers or sisters who had finished school came in for the test.

Whenever a second clinic was held in a high school or teachers' college, new students and non-reactors were tested. These clinics were not ideal in that it was not usually possible to return to the high school and repeat the test with a milligram of tuberculin when the tenth of a milligram produced no reaction. It is interesting to recall, however, that following the publicity given to the clinics held in 1932 and 1933, the demand for similar clinics became so great that six members of the medical department of the Wisconsin Anti-Tuberculosis Association, together with a staff of nurses and social workers, were unable to hold clinics as fast as high schools requested them.

In 1933, the late Dr. R. H. Stiehm of the medical staff of the Wisconsin Anti-Tuberculosis Association was loaned to the University of Wisconsin for six weeks to test newly enrolled students. The results of this work were so impressive that he was taken over as a member of the university faculty. The program inaugurated by him has been continued since and has won wide recognition. The effectiveness of this program from a case-finding viewpoint may be seen from the following facts:

During the 14-year period 1919-1933, before tuberculin testing, an average of 10 cases of pulmonary tuberculosis were found each year among University of Wisconsin students.

During the year 1933-34, when students were tuberculin tested, as part of their routine examination, with x-rays, physical examinations, and careful medical histories of reactors, 43 cases were found, or a 330 per cent increase.

Seventeen students were advised to withdraw from school, compared with an average of four in previous years, twelve of whom entered sanatoria.

Following these clinics, the campaign for tuberculin testing received marked impetus, and at the present time many physicians and health officers are tuberculin testing regularly. It is quite impossible to give even an approxi-

mate number of those having received an intradermal test in the state of Wisconsin. When the clinics were first held, there were a considerable number of vacant beds in the county sanatoria of the state and it often required time and patience on the part of the doctor, or the public health nurse, to induce the patient with active tuberculosis to accept sanatorium care. The common objection offered by the layman was that most patients who went to the sanatorium died. The average layman did not realize that the death was due in most cases to neglect of early tuberculosis and lack of sanatorium treatment. It was not long until most vacant beds were occupied and additional beds were being provided either in new institutions or in addition to already existing facilities.

Many family physicians, who were fortunate enough to have x-ray equipment, felt they were not competent to read chest x-rays, and so the custom grew of sending them to the Wisconsin Anti-Tuberculosis Association for interpretation. This always brought a reasonably prompt interpretation from a member of the medical staff and, in many cases, suggestions as to how the chest x-rays might be improved. During the past five years, over 30,000 referred films have been read and interpreted at

the office of the association. In many cases when x-rays coming from a certain physician were poor in quality, a member of the medical staff called on him to help improve his film-taking technic.

In 1937 the association received a gift of \$25,000 and this money was used in part to purchase a 35 mm. x-ray unit which has been used in a large number of clinics where mass x-raying seemed desirable without a tuberculin test. About the same time the state health department purchased a 35 mm. unit and a 4x5 x-ray machine, and the Milwaukee health department procured a similar unit. These four units have screened scores of thousands of cases during the past three years. The work has been done to a considerable extent in large industrial plants where a preliminary tuberculin test did not seem advisable. A shortage of physicians and the desire to reach large war industries is to a considerable extent responsible for the present change in policy.

Has the pendulum swung too far? It is my opinion that the present tendency to neglect the tuberculin test is unfortunate and that we will ultimately return to the Mantoux test, the most certain method of locating early cases of clinical tuberculosis.

A Survey of Tuberculosis Observed at Freeman Clinic 1934-1944, and Related Statistics

Guy L. Hacker, M.D.

Dallas, Texas

THE purpose of this paper is to determine, from all available local data, whether Dallas is one of the areas where a tuberculosis survey would be worthwhile. The United States Public Health Service, through an act of Congress, is in the early process of inaugurating a nationwide tuberculosis control program. The original bill calls for the expenditure of ten million dollars. The first funds available for the use of the states will probably occur in January 1945. The state board of health plans to purchase a number of photo-fluorographic units with the general plan in mind of using these in areas of the state where the problem is acute. Coordinated with the case-finding project will be the extensive education and follow-up facilities. The plan of necessity will have to be worked out with the medical profession and the limitations devised by them agreed upon.

During the past ten years, there have been 18,018 admissions to the Freeman clinic. Each patient had a tuberculin test on admission. All reactors were referred to the tuberculosis department of the clinic for study. A dose of 0.1 milligram of old tuberculin was used for the initial test. Readings were made at the end of forty-eight hours (preferably at 72 or 96 hours). A reaction was recorded if the skin showed an area of redness at least 5 millimeters in diameter, with some *induration*. In sus-

picious cases where the reaction was not definite, a 1/100 dilution and occasionally a 1/10 dilution were used. The tests were administered by a technician and interpreted by a physician. Old tuberculin made by the large biological companies was used until the last few months. We have recently obtained some old tuberculin from the Saranac Laboratory in New York. This is of standard potency. Dilutions are made with a buffered phenolized solution which remains stable, even in a 1/1000 dilution, over a long period of time.

X-rays were made of the chest of every reactor. If under five years of age, x-rays were repeated on the average of every six months. For those five to ten years of age, films were taken every two or three years, and after eleven years, they were checked at least once a year.

SPECIFICITY OF THE TUBERCULIN TEST

The intradermal tuberculin test is the most specific test we have. A characteristic reaction means the patient has definitely been infected with tubercle bacilli. A failure to react to the test, if properly made and interpreted, and, if necessary, carried down through a 1/10 dilution, rules out tuberculosis in children, except in very rare cases. During the past ten years, I have not seen a proven case of tuberculosis in which the 1/10 dilution did not produce a reaction.

TABLE 1

Percent of Patients Who Were Reactors to Tuberculin Test at Freeman Clinic — 1934-1944			
	Number	Reactors	Percent Reactors
Total admissions	18,018	2,225	12.35
White	11,318	1,303	11.55
Mexican	1,049	228	21.73
Negro	5,651	689	12.19
Total admissions, 1940	2,924	333	11.38
Total admissions, 1941	3,102	321	10.34
Total admissions, 1942	2,167	287	13.24
Total admissions, 1943	1,943	273	14.05
High school students tested since 1939 (city)	3,681	820	22.00

Table 1 shows the number of admissions to the clinic during the past ten years and the percentage of reactors. Children are admitted to the clinic up to puberty, the average being six to eight years of age. The Mexican admissions showed about twice as many reactors as the white. The reactors in negroes is surprisingly low as compared to the white. One explanation is that the negro dies more rapidly than the white and does not have as much opportunity to disseminate the infection. Another possible explanation is that not enough emphasis on induration was placed by the interpreter. Obviously, in negroes, one must depend on induration rather than redness in interpreting the test.

BASIS FOR MAKING A DIAGNOSIS OF ACTIVE TUBERCULOSIS

1. Tuberculin reaction.
2. Positive sputum or stomach washing.
3. X-ray shadow.
4. Persistent elevation of temperature (temperature recorded four times daily [rectal] for two weeks).
5. Loss of weight.
6. Cough.
7. Sedimentation rate (started only recently).

BASIS FOR DIAGNOSIS OF A REACTOR AS INACTIVE

1. Essentially negative x-ray.
2. Negative sputum.
3. Normal temperature.
4. Good progress clinically.
5. Sedimentation rate (started only recently).

A sputum examination was made on all patients with a productive cough. Stomach washings were made on infants who were reactors. Either guinea pig inoculation or a culture was made. It has been suggested by some investigators that a more rapid method would be to inoculate non-infected guinea pigs and follow up with a tuberculin test in three or four weeks. The animal should react at the end of this time if the injected material contained tubercle bacilli.

TABLE 2
Classification of Reactors

1. Minimal primary tuberculosis	544
2. Tracheobronchial lymphadenitis	771
3. Miliary tuberculosis	7
4. Tuberculosis of vertebra	11
5. Tuberculous meningitis	7
6. Tuberculosis of lungs, far advanced	6
7. Tuberculosis of lungs, moderately advanced	3
8. Tuberculous pleuritis	3
9. Tuberculous pericarditis	1
10. Tuberculous peritonitis	3
11. Lung abscess	3
12. Tuberculosis of cervical lymph nodes	2
13. Tuberculosis of thyroid gland	1
14. Tuberculosis of hip joint	1
15. Psoas abscess	1

Table 2 shows the classification of the various reactors. The minimal primary tuberculosis group showed no significant change in the x-ray. The tracheobronchial lymphadenitis group showed some involvement of the hilar regions and usually a minimal involvement in the parenchyma. An occasional Ghon's tubercle was present. Practically all of these two groups were, as far as we could determine, inactive and were allowed to go to school, nursery, etc. It is interesting to note that only three were diagnosed as tuberculous pleuritis. I can remember seeing only one case in the last ten years with an effusion severe enough to require aspiration. Abscess of the lung is rare in children—only three of our cases were so diagnosed. These probably were of the reinfection type. Tuberculosis of the cervical lymph nodes does not occur now as frequently as in the past—only two cases were thus diagnosed.

TABLE 3

	White	Mexican	Negro
ACTIVE CASES:			
Active on admission	14	10	2
Becoming active during 10 years	5	2	13
Becoming inactive during 10 years	9	7	3
CONTACTS:			
Parents	180	26	52
Grandparents	37	4	1
Others not known	130	47	118
ISOLATION:			
Home	2	5	9
Sanatorium	12	3	1
Deaths	3	1	1

Table 3 emphasizes the small percentage of active cases observed. Unfortunately, a thorough history of contacts was not obtained on all the reactors. In the younger group the parents or grandparents were found to be the infectors in a large percent of the cases. In the older group the contacts were not known in many of the reactors. The death rate is inaccurate due to the fact we were unable to follow up our cases thoroughly.

A list of our reactors is routinely given to the Dallas Tuberculosis association. An examination of all close contacts is supposed to be made. I feel that one of the most important results of tuberculin testing in children is the clue it gives us in detecting active tuberculosis in the adult contacts. Oftentimes these adult contacts are in the early stages of the disease, most of them not suspecting they have the disease. It is important to isolate these active adults from the children. Children tolerate the first infection very well, but too often succumb to repeated overwhelming reinfection.

Our present needs:

1. A state law requiring all active cases of tuberculosis to be isolated. (I understand we will have some legislation in the near future, which will help enforce isolation of our active cases).
2. More hospital beds for active cases. (It is planned to have regional hospitals scattered over the state for the care of active tuberculosis. Dallas would be an ideal site for such an institution).
3. A case-finding program.

The first two needs would of necessity have to be provided for before a lot could be accomplished with a case-finding program. The question arises as to what is the best method of case finding. There is a difference of opinion among various investigators.

Myers of Minneapolis and Stewart of New Orleans

believe the most practical and thorough way is to do mass tuberculin testing of the general population. Since a tuberculin test, if properly done and interpreted is one of the most reliable tests we have, and since there is only a one per cent increase or less per year in reactors in some parts of the United States, this method would eliminate taking x-rays on a large percentage of the people. (Certain areas have a much higher percentage of reactors than this). For instance, roughly 30 per cent of 30-year-old people would be reactors. Therefore, only 30 per cent of this age group would need to be x-rayed to find what per cent were active. A tuberculin test, carried down through 1/1000 and 1/100 dilutions, which does not produce a reaction, rules out tuberculosis in children and active tuberculosis in adults in practically 90 to 100 per cent of the cases. Tuberculin reactors should be x-rayed annually after puberty. This often enables us to detect the location of lesions at a stage when they can be treated successfully. This method also makes people more tuberculosis-conscious. At the present time a good percentage of patients do not consult physicians until they have symptoms of the disease beyond the stage at which medical treatment can be of much help. This accounts in part for the high death rate in various sanatoriums.

Other methods suggested are examination of all contacts of active cases of tuberculosis. This detects a good number of cases in the immediate environment but fails to find cases from other contacts. All high school students should have the tuberculin test. The non-reactors should be retested annually. The reactors should have x-ray inspection of the chest annually.

All maids, food handlers, school teachers, and any other group coming in close contact with the public should have annual x-ray inspection of the chest. Tuberculin testing of a large number of school children in Beaumont showed that children coming from homes in

which maids were employed had a much higher percentage of tuberculin reactors than those without maids.

TABLE 4

	Total Number of Deaths (Tex.)	Rate Texas	Rate U. S.	Deaths from TB Under 5 Years (Tex.)
1934	4,020	66.8%	56.7%	121
1935	4,202	69.1	55.1	118
1936	4,374	71.1	55.9	110
1937	4,289	69.0	53.8	131
1938	4,129	65.8	49.1	121
1939	3,911	61.6	47.1	118
1940	3,797	59.1	45.9	114
1941	3,684	56.0	44.4	121
1942	3,568	53.2		129
1943	3,287	47.2		96
1944				

Table 4 shows the death rate from tuberculosis in Texas compared with the general mortality in the United States.

In the various large cities of the state the death rate in the Mexican race is ten times as high, and the negro rate twice as high as the white.

In spite of the justifiable gratification with which we may regard the great decrease in the total mortality from the disease in the last forty years, it is nevertheless very important not to lose sight of the disturbing fact that tuberculosis is still by far the most common cause of death in that valuable age period between fifteen and forty-five. In the United States in 1940, tuberculosis was responsible for 18.6 per cent of all deaths in persons between 15 and 24 years of age, and for 14.3 per cent of all deaths among individuals between 25 and 44 years of age.

The disease that still kills more than twice as many individuals as any other single cause of death during this particularly productive and enjoyable period of the life-span can hardly be jubilantly regarded as "nearly conquered."

(The author wishes to express his sincere appreciation of the work done by Miss Mary Abbie Jack and Miss Mary Kirkland in compiling statistics and analyzing the 18,000 admissions to the clinic.)

Continuation of the Mantoux Program in Rural Minnesota

Lewis S. Jordan, M.D.

Granite Falls, Minnesota

IN the issue of the JOURNAL-LANCET of October, 1942, there was a summary of a ten-year Mantoux program in rural Minnesota as conducted by Riverside Sanatorium, at Granite Falls. Further work has been done with pleasing results. In the continuation of this program of school testing which has been followed up in the four counties of Riverside sanatorium district—Chippewa, Renville, Lac qui Parle, and Yellow Medicine—no positive reactors were found in the most recent surveys in ten schools. The above four counties comprise an area of approximately 3,200 square miles located in the south central and western portion of Minnesota. The Mantoux testing program was commenced in 1930, and

has been continued periodically ever since. The same technic and the same strain of Saranac Lake O.T. has been used constantly, the dilution being 1:1000. A total of some 38,000 school children have been tested over this period of from 1930 to 1945. The tests have been repeated in the same communities, children from the same homes, and under similar conditions each time. Of a total of 16,897 children enrolled in the schools in the following report, 13.9 per cent of them were found to react on the first survey conducted in 1930. In the same schools in the 1944 survey, the incidence of infection, or tuberculin reactors, has shown a reduction to 3.4 per cent.

In the following summary of the results, only the totals are given of those schools which we have rechecked routinely during this period of observation. The scale used in judging a tuberculin reaction was the National Tuberculosis Association standard. The schools listed below show the indicated amount of drop in percentage of reactors in the first and last year in which they have been tested. Routine testing has been followed in most cases annually, or biennially, but figures of intervening years are not included as they have been previously published. In certain schools, due to emergency restrictions of material and help, since 1942, only the 1st, 9th, 10th, and 12th grades were tested.

School	Year	Percent Reactors
Bellingham	1935	7.7
	1944	0.
Bird Island (Parochial)	1932	25.7
	1944	0.
Boyd	1931	15.6
	1944	0.
Clara City (Parochial)	1934	30.5
	1944	0.
Clara City (Public)	1934	11.6
	1944	0.
Fairfax (Parochial)	1934	6.9
	1944	0.
Milan	1930	18.6
	1944	0.
Olivia (Parochial)	1934	14.4
	1944	0.
Nassau	1937	8.8
	1944	0.
Madison (Parochial)	1940	8.1
	1944	0.
Wood Lake	1930	8.6
	1944	5.
Montevideo	1934	13.6
	1944	6.8
Renville	1934	7.4
	1944	4.9
Echo	1931	10.8
	1944	1.3
Granite Falls	1931	9.3
	1944	6.3
Hanley Falls	1932	11.7
	1944	2.5
Marietta	1931	17.9
	1944	1.6
Clarkfield	1933	9.6
	1944	2.3
Buffalo Lake	1931	12.8
	1944	5.3
Olivia	1934	11.5
	1944	1.5
Morton	1934	13.6
	1944	2.9
Franklin	1934	12.2
	1944	3.5
Fairfax	1934	21.3
	1944	2.
Madison	1940	8.1
	1944	4.1
Canby	1939	4.4
	1944	3.3
Yellow Medicine County Rurals	1935	8.2
	1944	.9
Chippewa County Rurals	1944	2.2
Lac qui Parle County Rurals	1944	.9
Renville County Rurals	1944	4.2
Schools not previously tested:		
Hector	1944	2.1
Maynard	1944	1.7
Danube	1944	7.3

The foregoing schools in this report were picked from some 250 schools tested in our district, which included rural schools. The total decrease in percentage in all

schools tested is shown clearly by the following comparison:

Percentage of tuberculin reactors, first test—13.9.

Percentage of tuberculin reactors, last test—3.4.

This is a 75.5 per cent reduction in the incident of reactors in our schools. We attribute this drop in the percentage to the following factors:

1. Educational, in order to gain cooperation. a) Talks to schools, parent-teacher organizations, farm bureau groups, civic bodies, and school board; b) demonstrations and literature to both parents and pupils in every school.

2. Follow-up field nurse service. a) Roentgenographs of chests of all tuberculin reactors; b) careful investigations of home conditions and chest roentgenographs of any suspects or other suspected contacts; c) a careful history of any possible contacts that may have been broken previous to our entry into the field.

3. Follow-up of all reactors in from three months to a year with a second x-ray. Advise of yearly x-ray check-up of all reactors.

4. Break all contacts with a known case of pulmonary tuberculosis by admitting open case to the sanatorium whenever possible, where control can be instituted. If this is not possible, to place any children or young adults in another home away from possible contact with the open case. Instructions to prevent spread of disease.

5. Testing and x-raying the tuberculin reactors of all school personnel to include teachers, bus drivers, cooks, janitors, and office employees.

As has been shown in the foregoing table of results, our rural schools have dropped from 8.2 tuberculin reactors to 2.1 per cent. This is for the whole group of 106 rural schools in the four counties, in which 2,768 children were tested. There is a definite difference in the rate of decrease of the incidence of infection shown when we compare our rural schools with the combined schools of our larger towns and small cities. In these latter, there has been a drop of from about 13.5 per cent to 6.5 per cent. This difference can be attributed to the fact that in the larger towns and smaller cities, it is much harder to locate and isolate contacts, open cases of tuberculosis, than it is in the rural districts. There too exists the fact that the average child's sphere of possible infection is manifold greater in cities and larger towns than is that of those who live in the country and attend rural schools.

Bearing in mind that most of our cases of active pulmonary tuberculosis in years to come will develop from the group of school children who are reactors to the tuberculin test today, we feel that it is important to stress that all such reactors should be carefully watched, x-rayed annually, the disease be located early, and wherever possible, the source of infection traced to prevent further spread of the disease. In view of the simplicity of repeated Mantoux testing as a means for searching out those who have already become infected, let us continue the work with increased ardor and let no one who calls himself a physician be guilty of the refusal to use the simple weapons which we have in our hands to fight and control tuberculosis. Those weapons are the tuberculin test and the x-ray. As an economy measure in areas where there is a low percentage of tuberculin reactors we feel that the tuberculin test should come first, and the x-ray inspection of the chest should be limited to the reactors, rather than to attempt a mass x-ray program. When an individual reacts to tuberculin two important facts are immediately established: 1) The individual is at least a potential case of clinical tuberculosis; and 2) there has been a source of infection which may be sought among contacts.

The fact that an individual reacts to tuberculin immediately arouses the patient's interest in tuberculosis and he desires facts concerning the potentialities of the infection. The logic of periodic examinations, including x-ray film inspection of the chest, becomes obvious, whereas, if only an x-ray film inspection is made of the chest and is reported normal, it is often exceedingly difficult to convince the individual that subsequent periodic examinations are indicated. To us it seems far better to concentrate on the small percentage of tuberculin reactors where potential clinical tuberculosis exists than to devote time and energy to making x-ray inspections of the much higher percentage in whom there is no possibility of finding clinical tuberculosis.

An Unusual Case of Primary Carcinoma of the Liver Associated with Diabetes Mellitus, Pulmonary Tuberculosis and Tuberculous Empyema

S. G. Clayman, M.D.[†]

San Haven, North Dakota

THIS is a report of an unusual case of primary carcinoma of the liver, associated with diabetes and far advanced pulmonary tuberculosis. The patient was a fifty-eight year old white male of Scandinavian extraction. His occupation was that of a fireman. His father was said to have died at the age of sixty-two of a ruptured appendix; his mother at the age of seventy-six of a stroke. The patient had three sisters, all living and well. There were no brothers. The patient was not married.

Previous to his admission to the North Dakota State Tuberculosis Sanatorium, the patient had experienced influenza in 1919, and had had diabetes since 1938. Otherwise there were no other pertinent findings in the past history, except an alleged fracture of the middle right ribs two years previous to admission.

The patient was admitted to the sanatorium October 23, 1943. The chief complaints were loss of weight of about fifteen pounds during the last two months, and repeated pulmonary hemorrhages one month previous to admission.

The patient stated that he had been perfectly well in the fall of 1938. At that time, he was admitted to a local hospital because of headaches, a "plugged-up" feeling in his nose, low grade fever, and chills. The diagnosis was sinusitis. Following his discharge from the hospital after ten days, the patient noted the classical signs of diabetes: polyuria, polydipsia, polyphagia, frequency, and loss of weight. Also, he noted at this time a feeling of being sleepy all the time. The patient saw his local doctor, diabetes was diagnosed, and treatment was instituted, being solely that of a diet regulation. No insulin was used at this time.

Two months prior to his admission to the sanatorium, the patient noted continuing loss of weight from 180 pounds to 160 pounds, and therefore, in addition to his dietary regulation he was put on insulin, about 20 units of protamine twice a day. The patient improved, following this addition to his treatment. However, about one month previous to his admission, because he was continuing to lose weight and because he had three distinct pulmonary hemorrhages, one being about 8 ounces in amount, chest x-ray was taken, was diagnosed as pulmonary tuberculosis, and the patient was admitted to the sanatorium for treatment.

Physical examination showed the patient to be about 6 feet 1 inch (73 inches) in height, having an admission weight of 145 pounds as compared to his usual weight of about 200 pounds. Blood pressure was 140/90. In general appearance the patient was a well developed,

[†]Resident physician, North Dakota State Tuberculosis Sanatorium.

very poorly nourished, senile white male, and had what was described as a very definite bilateral malar flush. The patient appeared acutely ill. Examination of the conjunctiva and sclera at that time did not reveal any findings of jaundice. When the patient was questioned about his peculiar gray pallor, he explained that he had always looked like that and had been questioned frequently about this point. During the examination of the lungs, there was a hemorrhage of about 3 ounces of bright red frothy blood. Examination, as well as previous x-rays, showed this to be coming from the left lung. Hence, the patient was taken to surgery and a left pneumothorax instituted in order to control the pulmonary hemorrhage. The introduction on October 26, 1943, of about 1,000 cc. of air in divided dosages was sufficient to partially control the pulmonary hemorrhages. Pneumothorax was continued on the left, and on January 20, 1944, left pneumonolysis was done in order to obtain a more satisfactory form of collapse of the left lung. At pneumonolysis, it was seen that there were numerous caseous areas in the partially collapsed upper lobe. Under direct thoracoscopic control, large heavy band adhesions were completely cauterized and severed, and it was seen that the collapse was greatly increased following this. The patient made an uneventful recovery from this closed intrapleural pneumonolysis.[‡]

On March 10, 1944, the patient developed a tuberculous pleural effusion, and was aspirated. Thereafter the patient was frequently aspirated, and on April 10, one month later, there was a typical tuberculous empyema present. This pleural fluid was positive for tuberculosis by cultures. Blood agar plates for the presence of non-tuberculous organisms were negative. The patient was continued to be aspirated at frequent intervals, usually at seven-day intervals. Treatment consisted of this frequent aspiration and the instillation of 5 per cent sulfathiazole suspension intrapleurally, which very definitely slowed down the growth of the tubercle bacillus intrapleurally. The patient was last aspirated September 15, 1944. Thereafter, the intrapleural space remained dry, and the tuberculous empyema was considered to be quiescent and inactive.

The patient's diabetes responded quickly to treatment. Because of the combination of pulmonary tuberculosis and diabetes, the patient was put on a high caloric, high carbohydrate diet, as follows: Calories, 2,000; carbohydrates, 200 grams; protein, 70 grams; fat, 100 grams. Diet was changed six months later to: Calories, 2,400; carbohydrates, 260 grams; protein, 92 grams; fat, 120 grams. The patient was soon controlled with a dosage of protamine zinc insulin, units 42, and regular insulin,

[‡]Dr. W. L. Wallbank, superintendent, performed this operation.

units 32, in the mornings. Under this regimen the patient gained in weight from an admission weight to the last weight recorded at 159 pounds.

The only pertinent point in retrospect of the patient's clinical condition was that he seemed to do very well for an elderly patient with far-advanced pulmonary tuberculosis complicated by hemorrhage and empyema, and also complicated by diabetes. It was noted by his roommates and by myself that he was particularly slow in his reaction time, and demonstrated a rather parkinsonian type of behavior. It was a well appreciated joke that he slept at long intervals, far more than it would seem necessary.

The patient's sputum, which had been positive upon admission, became negative eight months after admission and remained so from that time on.

The patient was perfectly well, had been worked up to full bathroom privileges, was going to the theater and to church, when suddenly on November 22, 1944, the patient complained of being sick to his stomach. He had been visiting patients in the various parts of the infirmary when he suddenly felt like vomiting, went to the bathroom, and there was a large emesis of undigested food. This was at 9:30 P.M. At first the patient insisted that the doctor not be called, and he was seen at 11:00 P.M., complaining of pain in the upper abdomen. The temperature at this time was 98.4°, the pulse 84. White blood count was 8,450. Blood pressure was 150/90. Fluoroscopic examination was satisfactory; the chest was in no way changed on fluoroscopic examination, nor were there any intra-peritoneal pockets of air present. On abdominal examination, there was epigastric tenderness, although the abdomen was perfectly soft. Rectal examination was normal. Peristalsis was heard and was normal, although slightly increased. The patient at this time had an acute gastritis, etiology undetermined. Considered as an unlikely possibility was that of a peptic ulcer rupture. The patient was given sodium amytal, grains 3, and was placed under observation.

At 12:50 A.M., the patient was seen again. At this time he was complaining of terrific pain in the abdomen. He was vomiting gastric contents. The abdomen, after the patient quieted down, was still perfectly soft, although the patient complained of tenderness in the epigastric region. White blood count was repeated, and was the same as on the previous count. Differential was normal. Urinalysis was normal. The patient was re-examined at 5:00 A.M. At this time the blood count was 7,500, but polymorphonuclear count was 93 per cent. Urine now showed 75 milligrams of albumen, but was otherwise normal. Temperature was 97.8° by rectum. Examination showed that the abdomen was tender but soft. Peristalsis was heard, but was exaggerated. The patient was given 1,000 cc. of 5 per cent glucose in normal saline intravenously, this amount being covered by 22 units of regular insulin instituted through the tubing. At 7:00

A.M., the patient was sleeping and his condition seemed to be improved, although there was much moaning and groaning in his sleep. X-rays of the chest and abdomen taken at 4:50 A.M. that morning did not show any intra-peritoneal air nor any change in the x-ray picture of the chest. At 10:00 A.M. that morning, the patient complained of soreness throughout the entire abdomen, although he could not localize the pain. At 1:00 P.M., he complained of a severe pain in the epigastrium. This was followed by a rise of temperature to 100.8° rectally at 2:00 P.M., by emesis of small amounts of brownish stained mucous contents. At 2:30 P.M., the patient experienced a slight chill and was becoming very restless. The pulse was 118, respirations 48 per minute. At 5:15 that afternoon, 5 per cent dextrose solution in normal saline was begun, this covered by regular insulin, units 40. Two hours later the patient complained of being very warm, seemed to be irrational, attempted to get out of bed, his color became very poor, respirations very labored (described as gurgling) and at 7:40 P.M., the patient expired.

Autopsy was done, and the only findings of note in addition to the collapsed left lung were many scattered yellow-white hard circular masses. These were found exclusively in the liver in all lobes. A very careful search for a primary was made, but none was found. Examination of sections by Dr. A. K. Saiki of the University of North Dakota Department of Bacteriology and Pathology showed adenocarcinoma, grade II. Diagnosis was that of a primary carcinoma of the liver, of bile duct origin.

This case is being reported because of the fact that the patient experienced no symptoms of a primary carcinoma of the liver until twenty-three hours before his death. He was perfectly well, and had apparently overcome his pulmonary tuberculosis with its complications, and was also controlling his diabetes. The patient was gaining weight and strength, until initiation of his terminal illness. At no time was jaundice noted by any observer until at autopsy it was noted very definitely that the sclera were jaundiced. The sudden terminal event was undoubtedly due to pressure on the bile duct and to terminal right cardiac failure.

SUMMARY

An unusual case of primary carcinoma of the liver was reported. This case was not diagnosed until autopsy, and there were no symptoms referable to carcinoma of the liver until twenty-three hours before the patient's death. The patient must have had this primary carcinoma of the liver for at least a year, and still he successfully overcame pulmonary tuberculosis, far advanced, which had been complicated by pulmonary hemorrhages and tuberculous empyema. Also, the patient successfully controlled a moderately severe case of diabetes mellitus at the same time.

The Control and Eradication of Animal Tuberculosis

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Washington, D. C.

AT this time all of the counties in the United States, all of Puerto Rico and the Virgin Islands, are included in the modified tuberculosis-free area, meaning that the incidence of this disease in cattle is less than one-half of one per cent. In fact, it is now just about two-tenths of one per cent, and in many states there is hardly any.

It is important that the cattle owners and others interested pay particular attention to checking up on the work in order to hold the ground already gained. It has been very difficult to meet this task due to conditions brought about by World War II. Several hundred federal and state veterinarians who were devoting all or part of their time to tuberculin testing and work in connection with Bang's disease of cattle, joined the armed forces and most of them are still in the service.

Tuberculin has been used in this country to diagnose tuberculosis in cattle since its discovery by Koch in 1890. In the early work, owners of cattle would volunteer to have their herds tested, but in a few years there were requirements in various parts of the country calling for the tuberculin testing of all dairy cows supplying milk to towns and municipalities. Dr. J. Arthur Myers has brought out in his book, *Man's Greatest Victory Over Tuberculosis*, some interesting facts in connection with the difficulties encountered in convincing people in certain communities of the importance of the eradication of tuberculosis in livestock. In some localities this opposition was quite highly organized and it was necessary to resort to the courts in order to proceed with the work. However, a great majority of the people were in favor of it after they understood what it was intended to accomplish.

The goal under the federal-state cooperative plan was to include all counties in the modified accredited area; it was possible to place the last two counties in California, the last state to be accredited, in this status November 1, 1940. Altogether about 271,000,000 tuberculin tests were made of cattle in the official cooperative work during the fiscal years 1917-1944. Of course, many of these were retests. The total number of reactors removed for slaughter during that time was about 3,800,000, the largest number being in the states where there were extensive dairy interests.

Splendid cooperation has been received from the state livestock sanitary officials and many other interested persons, including Professor H. R. Smith, now general manager, National Live Stock Loss Prevention Board, formerly livestock commissioner National Live Stock Exchange. Mr. Smith has been of great assistance in the work; he has written and published much in regard to the eradication of tuberculosis in cattle and the importance of eradicating tuberculosis from swine and poultry.

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TUBERCULIN IMPROVED BY RESEARCH

During all of this time the research workers were carefully studying different phases of the disease, with special interest in improving the tuberculin. We owe much to the late Dr. Marion Dorset and his co-workers in this Bureau for what has been accomplished in the preparation of an improved tuberculin. The field forces cooperated with the research workers in order that a study could be made of the action of different tuberculins in testing cattle under natural conditions. A full report of the results, as well as other work with different dilutions of tuberculin, is contained in a paper by Dr. Dorset which appeared in the *Journal of the American Veterinary Medical Association*, 1934, LXXXIV N.S., Vol. 37, No. 3, pp. 439-456.

The tuberculin that has been used for the last fourteen years is prepared by using a synthetic medium. It was only through the ability to prepare large quantities of it that it was possible to give the tuberculin test to over 25,000,000 cattle in the fiscal year 1935 in the federal-state cooperative program. A large federal appropriation was made by Congress in 1934 for this work, and also for eradicating Bang's disease in cattle. At that time it was not necessary for the states to make payments in order that the owners might receive federal indemnity, making it possible to proceed without delay in many parts of the country where veterinarians were available.

The first annual appropriation by Congress for carrying on the eradication of tuberculosis in cattle in a cooperative manner, was made March 4, 1917, and amounted to \$75,000.00. This was greatly increased within a few years. Expenditures for this work reached the peak in the fiscal year 1935 when the federal expenditures alone were about \$13,000,000.00 for operating expenses and indemnity. The cooperating states and counties used about \$9,000,000.00 for the same purpose that year. Since that time the expenditures have been considerably reduced; the total federal expenditures for operating expenses and indemnity are now about \$1,350,000.00 annually, and the state about \$2,900,000.00.

ECONOMIC IMPORTANCE OF TUBERCULOSIS ERADICATION

The economic importance of eradicating this disease in livestock is great. If the work had not been taken up and carried on to the extent that it has been, the losses due to condemnation of cattle and hogs on account of tuberculosis would today be many times what they were in the past because the incidence of the disease was increasing; consequently, our present meat supply would have been much smaller than it is.

At establishments operating under federal supervision during the year ending June 30, 1944, about 12,900,000 cattle were slaughtered (not including reactors to a

tuberculin test) and only 5,778 showed any evidence of tuberculosis, 1,435 considered unfit for food. Similar statistics for 1917 show that about 9,000,000 cattle were slaughtered, over 195,000 showed evidence of tuberculosis, and about 40,000 were condemned as unfit for food.

In the case of swine slaughtered under federal supervision, the records indicate that during the fiscal year 1944, about 75,000,000 hogs were killed and tuberculosis was found, mostly to a slight extent, in about 5,185,000. The total number of carcasses condemned was about 16,000.

The aid furnished by the meat-inspection service, both federal and local, has been very helpful in tuberculosis-eradication work, and is especially so at this time. Cattle and hogs found on postmortem examination to be affected with tuberculosis are reported to officials of this bureau; in many cases it is possible to trace their origin and take the necessary measures to eradicate the disease from the infected premises.

CAUSES OF CASES WITH NO VISIBLE LESIONS

Much research work has been conducted by both state and federal workers to determine some of the reasons why gross lesions of tuberculosis are not found in all cases where a diagnosis of tuberculosis is made through the use of tuberculin. There are a number of such reasons brought out in a very interesting article by Dr. A. B. Crawford of the Animal Disease Station of the Bureau at Beltsville, Maryland, which was published in the *Journal of the American Veterinary Medical Association* November 1936. Dr. Crawford made an extensive study of this subject and his work is a valuable contribution to the program.

In the central and north central states there is a considerable amount of avian tuberculosis which spreads to the hogs and sometimes to the cattle. This causes the cattle to become allergic to tuberculin although no visible lesions are produced in them by the avian type. This is, of course, confusing to the operators in the field and is one of the important reasons for eliminating the avian type of the disease. Although much has been accomplished in controlling it, there is much more to be done and its practical eradication should be accomplished in time. The veterinarians who are tuberculin testing cattle in the states where most of the avian tuberculosis is located are helping on this program by advising flock owners how to best handle their flocks in order to rid their premises of the disease.

War always spotlights the dramatic role played by surgery and medicine. Less frequently does some unusual situation emphasize the important role played by preventive medicine as, for instance, when our troops landed in the Philippines. There they found the civilian population suffering woefully for lack of a preventive medicine program under Japanese domination. Sanitation had deteriorated. Food was inadequate. Great numbers of the people were suffering from tropical ulcers, yaws, intestinal diseases and vitamin deficiency diseases. They were endangered by cholera, smallpox and typhoid fever. With the return of our troops, preventive medicine is again being practiced. Carrying out plans prepared by the Civil Public Health Division of the Preventive Medicine Service, Office of The Surgeon General, sanitation is being restored. People are being immunized against diseases. Health offices have been re-established in communities wrested from the Japs and dental clinics, dispensaries and hospitals have been established.—(*News Notes of Office of Surgeon General, Technical Information Div.*).

BOVINE TUBERCULOSIS IN RELATION TO HUMAN TUBERCULOSIS

We know there has been a marked reduction in the tuberculosis mortality of humans, and it is fair to assume that at least a part of this reduction has been due to the control and eradication of tuberculosis in cattle. Recently a brief report on the causes of crippling in children appeared in *Everybody's Health*, written by another good friend and helper in this work, Dr. D. C. Lochead of Rochester, Minnesota. He stated that in reviewing the situation with reference to the causes of crippling of children, only 1.29 per cent of the cases recently registered with the Section for Crippled Children of the Minnesota Division of Social Welfare are crippled as a result of tuberculosis; also that thirty years ago 75 per cent of the children at the Gillette State Hospital for Crippled Children were there because of tuberculosis of the bones and joints, but today there are virtually no cases of this type at the hospital.

One of the problems that still exists is that some human cases of pulmonary tuberculosis are caused by the bovine type of the germ. Only last year a veterinarian engaged in this work in New York State found that the disease had been spread to four herds of cattle by one person, who had originally contracted it from cattle.[‡] Close cooperation between veterinarians engaged in eradicating this disease in cattle and persons in charge of tuberculosis sanatoriums is desirable. Many times a knowledge of this type of tuberculosis with which a patient is infected might lead to the location of tuberculosis in cattle. It is gratifying to know that plans have been made by the United States Public Health Service to increase greatly the activities in connection with the eradication of human tuberculosis.

PLANS FOR THE FUTURE

It is the purpose of the cooperating officials in charge of tuberculosis eradication of livestock to have the work continued as much as necessary. This will mean applying approximately 9,000,000 tuberculin tests to cattle each year for several years and increasing the forces engaged in the eradication of tuberculosis in poultry and swine.

There should be a careful check-up on all reported cases of tuberculosis in cattle and hogs from the establishments where they are slaughtered.

[‡]Man a Source of Bovine Tuberculosis in Cattle, by F. J. Tice, The Cornell Veterinarian, October 1944.

Tuberculosis Deaths Among Children*

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GREAT progress has been made in the reduction of deaths from tuberculosis since the beginning of this century. For the United States as a whole, the tuberculosis death rate in 1940 was less than one fourth of that in 1900. In Minnesota the decline has been even greater. During this same period the tuberculosis death rate in children has been decreasing at a more rapid rate than that for the general population.

Data are available on tuberculosis deaths in children in Minnesota for a thirty-year period from 1915 to 1944. In a previous report¹ tuberculosis mortality in Minnesota children was analyzed through the year 1932. It seemed of interest to bring this study up to date and determine whether there has been a continuation of the declining death rate during the past twelve years.

Deaths occurring from tuberculosis in Minnesota in children under 15 years of age for the thirty-year period 1915-1944 inclusive were studied. The data were obtained from the tuberculosis mortality records of the Division of Preventable Diseases of the Minnesota Department of Health and mortality rates computed per 100,000 children in each age group. The method of estimating the population for each age group has been described previously.²

The deaths for each of the years were divided into age groups and classified according to the type of tuberculosis causing the death. Tuberculous meningitis, pulmonary tuberculosis and miliary tuberculosis continue to be the three leading types of tuberculosis causing death in children. Bone and joint tuberculosis and lymph node tuberculosis, while responsible for a small number of deaths in children, are relatively unimportant in this state.

MORTALITY RATES FROM ALL FORMS OF TUBERCULOSIS

Table 1 shows the number of deaths and the death rate from all forms of tuberculosis in children in Minnesota by age groups for each year from 1915 to 1944, inclusive. In 1915 there were 260 deaths from tuberculosis in children under 15 years of age, compared to 26 in the year 1944.

Because of the small number of deaths now occurring for each age group, a comparison of mortality rates from year to year is of little value. The thirty-year period was therefore divided into six five-year periods, and the average mortality rate for each age group computed for each of the five years. These data are presented in Table 2. This shows a striking reduction in the mortality for all children under 15 years of age: from a rate of 34.1 for the years 1915-1919 to a rate of 3.9 for the years 1940-1944. This represents a reduction of 88 per cent during this period. While the reduction in each age group has been remarkable, the greatest reduction, that

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of 93 per cent, occurred in infants under one year of age, the rate being reduced from 130 in 1915-1919 to 9 in 1940-1944. For all ages in Minnesota the tuberculosis mortality rate has decreased from 103.1 in 1915-1919 to 27.5 in 1940-1944, a reduction of 73 per cent, a striking decline although not as great as occurred in children.

Table 3 presents the number of deaths from five types of tuberculosis in children under 15 years of age in Minnesota for the years 1915 to 1944. Tuberculous meningitis was responsible for 50 per cent of tuberculosis deaths of children under 15 years of age, and pulmonary tuberculosis, 37 per cent. Up to 5 years of age, tuberculous meningitis is the most common form of tuberculosis causing death in children. In the 10 to 15-year age group, two thirds of tuberculosis deaths were due to pulmonary tuberculosis. Miliary tuberculosis, likewise, was a more common cause of death in the younger children than in those over 10 years of age. It is probable that many of the deaths classified as tuberculous meningitis actually were miliary in type, as studies of autopsies on children dying of tuberculous meningitis frequently show an undiagnosed miliary tuberculosis.

The death rates from tuberculous meningitis in children under 15 years for the thirty-year period are shown in Table 4. For the first five-year period, the mortality rate for tuberculous meningitis in all children under 15 years was 15.7, while in the last five-year period the rate was 1.8, or a decrease of 88 per cent. For children under one year of age in whom the death rate from tuberculous meningitis formerly was higher than in any age group, the rate was reduced during this period from 74.2 to 4.7, or a reduction of 93 per cent. It is of interest that during the past ten years there has been a higher death rate from tuberculous meningitis in children between one and two years of age than in infants under one year.

Table 5 shows the mortality rates from pulmonary tuberculosis in children under 15 years of age. The death rate has been reduced from 10.8 in 1915-1919 to 0.9 in 1940-1944, or a reduction of 91 per cent. In children under one year the rate has been reduced 94 per cent, while in the 10- to 15-year-old group there has been a reduction of 92 per cent.

The mortality rates from miliary tuberculosis are presented in Table 6. With the exception of the group under one year of age, the number of deaths from miliary tuberculosis in children is so small that a comparison of the mortality rates means little. For all children under 15 years of age there was a reduction of 50 per cent during this thirty-year period, while for those under one year the reduction was 79 per cent.

SUMMARY

In the year 1944 there were only 26 deaths from all forms of tuberculosis in children under 15 years of age

TABLE 1
Tuberculosis Deaths and Death Rates Among Children in Minnesota, 1915-1944

Year	Total		Under 1 Year		1-2 Years		2-3 Years		3-4 Years		4-5 Years		5-10 Years		10-15 Years	
	Deaths	Rate*	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
1915	260	36.7	85	178.0	29	64.5	9	18.2	10	20.0	6	12.2	57	24.1	64	27.8
1916	275	38.3	68	140.4	22	48.2	33	65.5	12	23.7	11	22.0	48	20.0	81	34.7
1917	265	36.4	73	148.7	21	45.4	23	45.3	36	50.8	9	17.8	37	15.2	66	27.9
1918	269	36.2	57	113.8	30	63.6	28	54.1	13	24.9	17	33.0	52	21.0	72	29.8
1919	173	23.1	35	69.3	22	46.2	17	32.5	14	26.5	13	25.0	31	12.4	41	16.8
1920	210	28.2	40	81.4	28	52.5	15	28.5	15	27.8	8	15.2	40	16.1	64	27.3
1921	159	21.0	29	58.2	25	46.1	9	16.8	12	21.8	2	3.7	36	14.2	46	19.3
1922	133	17.3	36	71.4	20	36.4	9	16.6	6	10.7	6	11.0	25	9.7	31	12.9
1923	190	24.5	46	90.1	34	61.2	14	25.5	13	23.0	13	23.6	28	10.7	42	17.3
1924	141	18.0	31	59.9	25	44.4	10	18.0	12	21.0	3	5.4	25	9.5	35	14.3
1925	132	16.6	38	72.5	6	10.5	7	12.4	7	12.1	6	10.6	26	9.7	42	17.0
1926	160	19.9	28	52.8	27	46.7	13	22.8	8	13.6	11	19.2	25	9.2	48	19.1
1927	126	16.2	26	51.8	15	27.8	17	31.5	6	13.2	4	7.4	19	7.2	39	15.8
1928	118	15.1	20	39.6	21	38.6	16	29.4	10	18.0	3	5.5	16	6.0	32	12.9
1929	108	13.7	20	39.3	12	21.9	11	20.1	12	21.4	5	9.1	15	5.6	33	13.2
1930	97	13.1	11	25.2	19	43.5	8	17.3	9	18.9	6	13.0	19	7.4	25	9.9
1931	68	9.1	4	9.1	10	22.7	5	10.7	6	12.5	3	6.4	15	5.8	25	9.8
1932	62	8.3	9	20.3	7	15.8	7	14.9	5	10.4	5	10.7	11	4.2	18	7.0
1933	65	8.6	11	24.7	12	27.0	3	6.4	5	10.1	4	8.0	13	5.0	17	6.6
1934	40	5.3	9	20.1	4	8.9	6	12.7	2	4.0	3	6.0	8	3.0	8	3.1
1935	52	6.8	9	20.0	11	24.4	6	12.6	6	11.9	2	4.0	5	1.9	13	5.0
1936	39	5.1	5	11.0	5	11.0	3	6.2	5	9.9	1	2.0	12	4.5	8	3.0
1937	47	6.1	9	19.7	8	17.5	3	6.2	4	7.8	2	3.9	9	3.3	12	4.5
1938	43	5.1	7	14.8	2	4.2	3	6.0	3	5.8	1	1.9	11	4.0	16	4.9
1939	25	2.9	3	6.3	7	14.6	1	2.0	1	1.9	1	1.9	4	1.4	8	2.4
1940	35	4.7	3	6.6	5	10.7	3	6.4	2	4.4	3	6.7	8	3.6	11	3.8
1941	25	3.4	3	6.5	7	14.9	4	8.4	5	10.9	0	0.0	1	0.5	5	1.7
1942	28	3.7	3	6.4	5	10.6	2	4.2	2	4.3	2	4.4	5	2.2	9	3.1
1943	31	4.1	7	14.9	9	18.9	0	0.0	3	6.4	2	4.3	3	1.3	7	2.4
1944	26	3.4	5	10.6	7	14.5	2	4.1	1	2.1	1	2.2	4	1.8	6	2.0
Total Deaths:	3402		730		455		287		245		153		608		924	

*Rates per hundred thousand of population in the age group.

TABLE 2
Death Rates from Tuberculosis in Children in Minnesota by Five Year Periods

Period	Years	Total	Under 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-10 Years	10-15 Years
1	1915-1919	34.1	130.0	53.6	43.1	29.2	22.0	18.5	27.4
2	1920-1924	21.8	72.2	48.1	21.1	20.9	11.8	12.0	18.2
3	1925-1929	16.3	51.2	29.1	23.2	15.7	10.4	7.5	15.8
4	1930-1934	8.9	19.9	23.6	12.4	11.2	8.8	5.1	7.3
5	1935-1939	5.2	14.6	14.4	6.6	7.5	2.7	3.0	4.0
6	1940-1944	3.9	9.0	13.9	4.6	5.6	3.5	1.9	2.6
Per cent decrease 1915-1919 and 1940-1944		89	93	74	89	81	84	90	91

TABLE 3
Deaths from Five Types of Tuberculosis in Children Under 15 Years of Age in Minnesota, 1915-1944

Type of Tuberculosis	Total	Under 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-10 Years	10-15 Years
Meningitis	50.3%*	61.2%	62.2%	64.4%	60.0%	65.2%	53.3%	23.5%
	1542	408	263	170	132	90	288	191
Pulmonary	37.0%	21.1%	23.2%	23.1%	24.5%	20.3%	35.0%	66.7%
	1133	161	98	61	54	28	189	542
Miliary	9.1%	12.3%	12.8%	9.5%	11.8%	10.1%	7.2%	4.9%
	280	82	54	25	26	14	39	40
Lymph node	1.7%	1.9%	1.2%	1.5%	1.4%	2.2%	1.9%	1.7%
	52	13	5	4	3	3	10	14
Bone and Joint	1.9%	0.4%	0.7%	1.5%	2.3%	2.2%	2.6%	3.2%
	58	3	3	4	5	3	14	26
Total	100%	667	423	264	220	138	540	813

*Percentages represent the proportion of deaths in each age group caused by the particular type of tuberculosis.

TABLE 4
Mortality Rates from Tuberculous Meningitis in Children in Minnesota

Period	Years	Total	Under 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-10 Years	10-15 Years
1	1915-1919	15.7	74.2	32.7	26.4	17.4	12.4	8.6	5.3
2	1920-1924	10.8	43.5	30.2	15.8	10.6	8.8	6.3	3.6
3	1925-1929	7.5	29.0	19.7	11.6	10.3	5.9	3.5	3.6
4	1930-1934	3.1	9.8	9.7	6.1	4.5	3.4	2.0	1.1
5	1935-1939	1.8	4.1	5.5	1.9	3.9	1.8	1.3	0.8
6	1940-1944	1.8	4.7	6.3	3.8	3.5	1.8	0.8	0.8
Per cent decrease 1915-1919 and 1940-1944		89	94	81	86	80	85	91	85

TABLE 5
Mortality Rates from Pulmonary Tuberculosis in Children in Minnesota

Period	Years	Total	Under 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-10 Years	10-15 Years
1	1915-1919	10.8	27.7	8.9	8.2	5.7	2.7	5.5	16.3
2	1920-1924	6.5	14.8	8.5	2.8	5.0	3.1	3.0	9.7
3	1925-1929	5.4	9.5	6.5	5.9	3.1	1.2	2.1	8.7
4	1930-1934	3.9	6.6	8.7	4.3	4.3	2.1	1.8	5.0
5	1935-1939	2.4	5.0	5.1	2.5	1.7	1.2	1.3	2.8
6	1940-1944	0.9	1.8	2.1	0.0	0.4	0.0	0.6	1.2
Per cent decrease 1915-1919 and 1940-1944		92	94	76	100	93	100	89	92

TABLE 6
Mortality Rates from Miliary Tuberculosis in Children in Minnesota

Period	Years	Total	Under 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5-10 Years	10-15 Years
1	1915-1919	1.8	10.0	3.3	1.6	2.4	0.4	0.6	1.2
2	1920-1924	1.6	7.8	3.2	1.8	2.2	1.1	0.6	1.0
3	1925-1929	1.1	4.9	3.3	2.5	1.3	1.0	0.3	0.4
4	1930-1934	0.8	2.2	3.7	1.8	1.5	1.7	0.5	0.1
5	1935-1939	0.8	5.7	2.0	1.1	0.9	0.0	0.4	0.2
6	1940-1944	0.9	2.1	5.5	0.8	1.7	1.3	0.4	0.2
Per cent decrease 1915-1919 and 1940-1944		50	79	+67	50	29	+225	33	83

in Minnesota. The mortality rate from tuberculosis in children has decreased so rapidly and reached such a low point that it must be near the irreducible minimum.

While the general mortality from tuberculosis in Minnesota has been reduced 73 per cent during the thirty-year period from 1915 to 1944, in all children under 15 years of age the reduction has been 88 per cent and in infants under one year of age, 93 per cent during this same period.

Tuberculous meningitis continues to be the leading form of tuberculosis causing death in children, with pulmonary tuberculosis second in importance. The reduc-

tion in mortality rates during the thirty-year period of this study was greater for pulmonary tuberculosis than for any other form.

The continued decline in tuberculosis mortality in children is convincing evidence of the effectiveness of the tuberculosis control program which has been carried on in Minnesota.

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Tuberculosis of the Cervical Lymph Nodes

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GENERAL CONSIDERATIONS

TUBERCULOSIS of the cervical lymph nodes develops as a result of the tuberculous lymphangitis draining a tuberculous focus in the upper respiratory tract. The primary respiratory focus may or may not be recognized as tuberculous. The portals of entry for the tubercle bacillus in these cases usually are the palatine and pharyngeal tonsils, but, less commonly, the lymphangitis may arise from a tuberculous lesion in the pharynx, mouth, ear or nose.

Tuberculosis of the cervical lymph nodes, caused by the bovine type of tubercle bacillus, has almost disappeared in this country. This has been attributed to the program of tuberculin testing of cattle on a nationwide scale and the universal pasteurization of milk. The human type of tubercle bacillus is responsible for most of the cases observed in the past decade.

The disease develops most frequently in young adults and children but may occur at any age.

Primary (childhood) or secondary (adult or reinfection) pulmonary tuberculosis may already be present when the tuberculosis becomes apparent in the cervical lymph nodes and the upper respiratory tuberculous focus and lymph nodes probably represent a secondary complication of the pulmonary tuberculosis. In other cases, the lungs are uninvolved and the tuberculous lymph nodes are part of a primary complex involving the upper respiratory tract alone. However, one must always remember that primary pulmonary tuberculosis may exist without a gross tuberculosis lesion being demonstrable by roentgenogram. Occasionally pulmonary tuberculosis may develop subsequent to the glandular tuberculosis and Van Zwaluwenburg and Grabfield¹ felt that the pulmonary infection developed by direct extension to the lung apices from the tonsils and cervical lymphatics. This view is not accepted generally.

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SYMPTOMS

Chronic or acute enlargement of the carotid lymph nodes, located near the superior border of the sternocleidomastoid muscle, usually is the earliest symptom. The superficial lymph nodes generally are infected first and the deep cervical nodes subsequently. The infection may remain localized in a single lymph node but, by the time the patient consults a physician, multiple nodes usually are involved. For a varying period of time, the nodes remain firm and the patient's chief complaint is the chronic, painless swelling. A cold abscess with fluctuation and tenderness may develop, if the disease continues to progress. Unless the pressure is relieved in some other way, the abscess eventually will rupture spontaneously with the formation of single or multiple sinuses. Havens², analyzing 125 unselected cases of cervical suppurations, found 18 due to the breaking down of tuberculous lymph nodes.



Fig. 1. Massive tuberculosis of the superficial and deep carotid lymph nodes.

DIAGNOSIS

The diagnosis may be difficult in the absence of pulmonary tuberculosis. Tuberculosis should be suspected whenever there is a chronic glandular swelling, especially if the enlargement is progressive and is larger than usually observed with chronic, non-specific inflammatory adenitis. A positive reaction to the tuberculin test will aid in making the correct diagnosis. Usually, a negative tuberculin reaction will eliminate tuberculosis as a diagnostic possibility, but a definite diagnosis cannot be made with finality on the evidence of a positive tuberculin test alone. If an abscess has formed, pus should be aspirated and examined for tubercle bacilli by smear, culture and guinea pig inoculation. A biopsy may be necessary, if the diagnosis cannot be established by other means. A roentgenogram of the chest should be taken in every case to determine the presence or absence of pulmonary tuberculosis. The roentgenogram should be repeated at least every six months, even if the initial study is negative. If a sinus has formed, the discharge should be studied bacteriologically, although tubercle bacilli may be difficult to demonstrate in the presence of chronic sinuses as they may be overgrown by the secondary invaders.



Fig. 2. Supraclavicular tuberculous lymph glands in multiple sinuses. This patient had no pulmonary tuberculosis. The tonsils and adenoids had been removed ten years prior to the onset of the glandular tuberculosis.

DIFFERENTIAL DIAGNOSIS

Tuberculous cervical lymphadenitis must be differentiated from acute and chronic non-specific lymphadenitis, syphilis, Hodgkin's disease, lymphosarcoma, lymphatic leukemia, benign lymphoma, glandular fever, thyroglossal and branchial cysts and secondary tumors. In acute inflammations of the cervical nodes, the glands are moderately enlarged, painful and tender to palpation.

Suppuration seldom occurs and the nodes usually recede as soon as the acute inflammation of the nose, throat or ear subsides. In chronic cervical lymphadenitis, the nodes are moderately enlarged, firm and homogeneous. Chronic sinusitis or chronic tonsillitis may be primary cause of the chronic lymphadenitis. Enlargement of the submental glands may occur secondary to a chancre of the lip and moderate, generalized lymph node enlargement often develops in the secondary stage of syphilis. Tertiary gummas of the cervical lymph nodes are exceedingly rare. The Wassermann or equivalent blood reaction is helpful but the diagnosis should not be made on that finding alone. Spirocheta pallida usually can be demonstrated in glands associated with primary or secondary syphilis. Hodgkin's disease occurs at any age but is most common in middle life. The cervical lymph node enlargement may be detected first because of their accessibility to examination, although nodes in other regions may be enlarged sooner but are not recognized as easily. Other findings of Hodgkin's disease such as splenomegaly or hepatomegaly, progressive anemia and fever will aid in the diagnosis. The subjective and objective symptoms of lymphosarcoma resemble those of Hodgkin's disease. Leukemia, especially of the lymphatic type, often is characterized by local or general lymphadenitis. The diagnosis usually can be made on the basis of the characteristic blood changes. Benign lymphoma is a rare condition characterized by the gradual enlargement of a single lymph node. According to Boyd³, the microscopic picture resembles lymphosarcoma but the accessory findings of lymphosarcoma are absent. Glandular fever or infectious mononucleosis is a benign condition causing slight to moderate enlargement of the cervical lymph nodes. It occurs in young people, lasts a few weeks and causes a moderate to marked mononuclear leucocytosis. Enlargement of the cervical nodes may occasionally be caused by metastases from a carcinoma of the mouth, lip, throat or larynx.



Fig. 3. Roentgenogram demonstrating calcification of tuberculosis, cervical lymph glands more marked on left side.

TREATMENT

The treatment will depend upon the stage of the condition when the diagnosis is made. General hygienic care is indicated in every case. Bed rest is necessary, if

fever, toxic symptoms, leucocytosis or increased sedimentation rate are present. Graduated exercise may be permitted after the unruptured nodes have receded and the sinus tracts, if present, have healed. There should be no evidence of abscess formation and the sedimentation rate should be normal before physical activity is allowed.

Local roentgen therapy, under the direction of an experienced roentgenologist, usually is recommended for all cases except those where a sinus has developed or a large abscess is present. Some roentgenologists recommend roentgen therapy even in the presence of suppurative complications. General exposure to natural or artificial sunlight is advisable for every case but the reaction of the patient must be checked carefully by frequent recordings of the temperature and pulse. The application of infra-red rays for twenty or thirty minutes twice daily has proved of value. Care must be exercised to prevent burning although some skin discoloration will result, if the heat lamp is used over a considerable period. Abscesses should be aspirated through a 20-gauge needle to prevent spontaneous rupture with unsightly scar formation. The needle should be introduced in the direction opposed to the weight of gravity to avoid a sinus forming through the needle tract. The abscess should be aspirated from above downward, after skin infiltration with one-half to one per cent novocaine solution.

Webster⁴ found that microscopic examination of tonsils removed from patients with tuberculous cervical adenitis revealed tubercles in 50 per cent. For this reason, many authors recommend routine removal of the palatine tonsils in all adults and both the pharyngeal and palatine tonsils in children with tuberculous cervical nodes. Lately, we have been more conservative in recommending tonsillectomy and, in children, adenoideectomy for this condition. Tonsillectomy and adenoideectomy usually should be delayed until the lymphadenitis has become quiescent. If surgery is to be performed, the affected nodes should receive roentgen treatment at least one week prior to surgery and should be repeated one month later. These precautions are recommended in order to prevent the breaking down of non-suppurative nodes. The possibility of abscess and sinus formation is increased, if the tonsillectomy is done during the acute stage of the glandular enlargement. We do not consider removal of the tonsils essential early in the course of treatment. Cervical gland tuberculosis frequently develops in a tonsillectomized child or adult so the tonsil is not the only portal of entry for the tubercle bacilli, although generally it is the most important one. Removal of the tonsils is seldom, if ever, an emergency procedure and the time of operation should be chosen carefully. They should not be removed until all discernible pathological activity in the lymph nodes has ceased.

Surgical removal of tuberculous lymph nodes is no longer recommended, except for biopsy purposes in questionable cases. The reasons for this have been well stated by Thompson.⁵ All of the tuberculous nodes cannot be removed, even by radical surgical procedures. Recurrences after surgical removal occur all too frequently. The immediate and ultimate prognosis with conservative treatment is good. Cosmetic results are better with conservative care, even if the abscessed nodes rupture spontaneously.

Tuberculosis of the cervical lymph nodes develops secondary to the lymphangitis draining a tuberculous focus in the upper respiratory tract.

Once more, attention should be called to the necessity of taking a chest roentgenogram in every patient with tuberculosis of the cervical lymph nodes. This should be done routinely, even in the absence of pulmonary symptoms. The chest examination should be repeated at least twice a year and sooner, if indicated. It is not unusual for active pulmonary tuberculosis to appear one or two years after the development of tuberculosis in the cervical lymph nodes.

SUMMARY

1. Tuberculosis of the cervical lymph nodes develops secondary to the lymphangitis draining a tuberculous focus in the upper respiratory tract.

2. Usually, tuberculosis of the palatine and pharyngeal tonsils is the source of the tuberculous lymphangitis. Less commonly, a tuberculous focus in the middle ear, mouth, nose or pharynx is responsible for the tuberculous lymphangitis.

3. The human type of tubercle bacillus causes most of the cases currently observed. The bovine type of infection has largely disappeared due to the control of tuberculosis in cattle and the pasteurization of milk.

4. The tuberculous focus in the upper respiratory tract may be primary or it may be secondary to active pulmonary tuberculosis. Roentgen examination of the lungs is indicated in every patient with tuberculosis of the cervical lymph nodes.

5. Chronic enlargement of the cervical lymph nodes usually causes the patient to consult a physician. In late cases, abscess and sinus formations are the prominent features.

6. The diagnosis is dependent upon a positive reaction to the tuberculin test, the recovery of tubercle bacilli, biopsy and the recognition of pulmonary tuberculosis, if present.

7. Confusion in diagnosis may be caused by acute and chronic non-specific lymphadenitis, Hodgkin's disease, lymphosarcoma, syphilis, lymphatic leukemia, benign lymphoma, infectious mononucleosis, branchial cysts and metastatic tumors.

8. Depending upon the stage of the disease when treatment is undertaken, the following are helpful: (a) bed rest during the stage of activity; (b) ultraviolet, roentgen and infra-red therapy; (c) aspiration of abscesses.

9. Surgical removal of tuberculous lymph nodes is not recommended unless essential for diagnosis.

10. Pharyngeal and palatine tonsils may be removed surgically after all activity in the lymph nodes has ceased. This should never be considered an emergency procedure.

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Syphilis of the Lung

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WE have reviewed the records of sixty patients who were referred to the section on dermatology and syphilology of the Mayo Clinic during the past twenty years because of the suspicion that they might have syphilis of the lung. In only four cases of the entire group was the eventual diagnosis pulmonary syphilis; the other patients were found to have either carcinoma, lymphoblastoma, teratoma, tuberculosis, pulmonary fibrosis or aneurysm or were lost track of so that it was impossible to make a conclusive diagnosis.

Of the four patients for whom a diagnosis of pulmonary syphilis was made three were men and one was a woman, their ages ranging from forty-nine to sixty-two years. In one case the spinal reactions were positive while they were negative in the other three and none of the patients manifested any confirmatory clinical evidence of syphilis. The serologic reactions of the blood in all cases were positive.

The clinical and laboratory data in the four cases in which the diagnosis was pulmonary syphilis were as follows:

1. The pulmonary symptoms noted were dyspnea, hoarseness, persistent cough with blood-tinged sputum, thoracic pains, weakness and loss of weight. Practically all of these symptoms were present at one time or another, although all of them were not noted simultaneously. Dyspnea, cough and bloody sputum were a prominent triad.

2. Physical findings were as follows: The examination of the thorax did not reveal physical findings that were of help in arriving at a diagnosis. Large coarse râles were heard if the involvement of the lung was of the nature of diffuse fibrosis. In patients with the nodular or tumor type of lesion the thoracic findings were vague, indefinite and of no diagnostic significance. Emphysema may be a part of the clinical picture but not necessarily a manifestation of the syphilis.

3. Thoracic roentgenographic findings were as follows: In three of the cases the roentgenograms showed a nodular mass or infiltration in either the upper part of the lung or throughout the pulmonary fields. The woman patient, however, displayed diffuse fibrosis of the pulmonary fields with no infiltrated masses or nodules.

4. On bronchoscopy and biopsy, the walls of the main branches of the bronchi were reported as "inflammatory."

5. The laboratory data were as follows: a) Repeated examinations of the sputums were negative for bacilli of tuberculosis in all cases. b) The serologic reactions of the blood were positive in all cases. c) No other significant laboratory data were noted in any of the cases.

In other words, the basis for a suspicion of pulmonary syphilis was the location and character of the infiltrative

process in the pulmonary fields, the absence of laboratory data and clinical findings that made any other definite diagnoses possible and the presence of positive serologic reactions of the blood for syphilis. The gummatous infiltrations in the lungs appeared either as discrete nodular or tumor masses in the vicinity of the hilus or as multiple nodules in both pulmonary fields. In one case the original roentgenographic interpretation was bilateral fibrosis. It is not possible to describe the characteristic roentgenographic picture of pulmonary syphilis, because of its variability.

The literature on syphilis of the lung was reviewed by Lieu in 1940. He called attention to the following types of pulmonary syphilis:

1. Gumma. a) Coarse, b) Miliary.
2. Diffuse syphilitic sclerosis of the pulmonary parenchyma or syphilitic scarring.
3. Bronchopneumonic type—similar to the pneumonia alba of congenital syphilis.
4. The fourth type mentioned by Lieu is syphilitic phthisis, which is an old term handed down from the pre-Wassermann test days and is now so controversial that it might well be dropped from the classification.

A therapeutic test for pulmonary syphilis was given to these four patients because of the roentgenographic findings, the presence of positive serologic reactions of the blood and the exclusion with the aid of the laboratory of other conditions that might produce lesions in the lung such as those observed in the roentgenograms. The result of the therapeutic test for syphilis, which is by no means infallible, is still the only means by which the presumptive diagnosis of pulmonary syphilis may be confirmed during the life of the patient. A therapeutic test for syphilis as a means of making a diagnosis is open to criticism, primarily because the improvement that may follow such treatment is sometimes due to the nonspecific effects of the drugs employed. Even though the symptoms improve or disappear and the roentgenographic findings of the thorax disappear, the deduction is not always warranted that the lesion in the thorax was syphilitic.

Admitting that "nonspecific" effects of antisyphilitic treatment may confuse such a diagnostic problem, such results of treatment are rare and not in themselves a sufficient reason to refrain from giving such a test to a person who is suspected of having syphilis of the lung. Although the diagnostic purist may not accept the disappearance of a lesion of the lung following treatment for syphilis as evidence that the original lesion was syphilitic, such a procedure is at present the only method that we have at hand for making a diagnosis in such cases. Accordingly, its continued use is nevertheless warranted until a more accurate procedure becomes available.

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Stokes has recommended the use of mercury or bismuth and iodides, avoiding the arsenicals because the "non-specific" effects are more likely to follow the use of the latter.

The observation of the patient following the therapeutic test is equally important in reaching the final diagnosis because as in other visceral forms of late syphilis it is rare for syphilis of the lung to recur following its involution under treatment. Therefore, the longer these patients remain free of the pulmonary symptoms following their disappearance under antisiphilitic treatment, the more certain the diagnosis of pulmonary syphilis becomes, because the so-called nonspecific beneficial effect of these remedies is frequently of short duration and is followed by a recurrence of the original signs and symptoms. Likewise in those cases of nonsyphilitic disease of the lung in which the patients derive benefit from an arsenical and bismuth, it is rare that a second course of treatment is accompanied by a disappearance of the symptoms for the second time. Fungous disease and spirochetal disease of the lung are examples in point.

A therapeutic test in a patient suspected of having syphilis of the lung should start cautiously. A two or three week preparation with intramuscular injections of bismuth should precede the use of the arsphenamines. Potassium iodide may be given during this preparatory period in doses up to 50 minims (3 cc.) three times a day by mouth. Mapharsen is a satisfactory arsenical to use. It should be given in doses ranging from 0.01 to 0.06 mg. at five day intervals for a series of ten to twelve injections. It is advisable to use small doses with the first few injections and to increase the dose according to the patient's tolerance. The bismuth injections may be given concurrently. If the patient's improvement following treatment is satisfactory, subsequent treatment should be continued as in other forms of visceral syphilis until the patient has had a minimum of thirty injections of mapharsen and sixty of bismuth over a period of eighteen months. The need for more intensive or extensive treatment will depend on the other manifestations of syphilis that the patient may display in the cardiovascular or central nervous system or elsewhere.

SUMMARY

The suspicion of pulmonary syphilis should be aroused by the appearance of nodular infiltrated lesions in the upper pulmonary fields or scattered throughout the lungs, the presence of positive serologic reactions of the blood and the negative reports from other diagnostic laboratory procedures. A therapeutic test for syphilis confirms or denies the presumptive diagnosis when the pulmonary symptoms disappear. Repeated roentgenograms of the thorax should be made at three to six month intervals to make sure that the lesions in the lungs which disappeared have not reappeared. If the patient continues to gain weight and maintains the improvement noted in his general condition, this fact is a further confirmation of the diagnosis of pulmonary syphilis. The serologic tests on the blood may not show any significant change for many years after treatment is stopped. It is justifiable to give such a therapeutic test

to a patient who presents a bizarre or unusual thoracic lesion associated with positive serologic reactions of the blood and in whom all the other laboratory procedures do not permit of a definite diagnosis, because syphilis of the lung is a rare disease, is not well understood and may masquerade in forms not herein described.

REPORT OF CASES

Case 1. A fifty-seven year old woman came to the clinic in 1933 because of increasing dyspnea of one year's duration. She was moderately obese. Examination of the heart showed an increase of cardiac dullness, heart sounds were distant and tone was of poor quality. No arrhythmia or murmurs were heard. Examination of the thorax revealed coarse râles throughout, but otherwise the examination gave negative results.

The laboratory data were as follows: Kolmer, 3 plus; Kahn, 3 plus; Kline, 4 plus; Hinton, negative. The spinal fluid gave negative reactions. The sputum was negative for tubercle bacilli. A roentgenogram of the thorax on November 19, 1933, was reported as showing bilateral fibrosis.

Antisiphilitic treatment, consisting of six injections of neoarsphenamine, each of 0.2 to 0.4 mg. and 15 injections of bismuth, was followed by 1) improvement in the roentgenographic findings as evidenced by decrease in the fibrosis; 2) general clinical improvement with disappearance of the dyspnea; 3) decrease in serologic reactions paralleling the clinical improvement. Repeated re-examinations and a recent observation eleven years after the original examination showed no pulmonary findings by roentgenographic or clinical examination, the serologic reactions were completely negative and the patient had no pulmonary symptoms. The total antisiphilitic treatment consisted of nine injections of neoarsphenamine (to which the patient became intolerant) and sixty injections of bismuth.

The reports of the roentgenographic examinations of the thorax following antisiphilitic treatment have been as follows: on February 8, 1934, considerable decrease in fibrosis since the original examination on November 19, 1933; on May 21, 1934, slight fibrosis of right base; on December 5, 1934, some fibrosis of both apices; on August 12, 1936, thorax negative; on April 7, 1942, thorax negative; on May 9, 1944, thorax negative.

Case 2. A forty-nine year old white man, a miner, when examined in October, 1940, revealed, on stereoscopic examination of the thorax, a shadow in the middle left lung (Fig. 1). The first pulmonary symptoms appeared in November, 1940, when he noted shortness of breath, weakness on exertion and a dry cough with minimal expectoration of a dark colored material. A tentative diagnosis of a pulmonary malignant lesion had been made at home. The history revealed that the patient had acquired syphilis in 1912.

A physical examination done on December 16, 1940, revealed small palpable cervical and axillary lymph nodes. The heart was of normal size and no murmurs were heard. The lungs were negative to auscultation. The blood pressure was 120 mm. of mercury systolic and 78 diastolic; the pulse was 120; temperature was 99.4° F. Serologic tests of the blood, including the Kline, Kahn, Hinton and Kolmer tests, all gave strongly positive results. Leukocytes numbered 12,800 and erythrocytes numbered 4,800,000 in each cubic millimeter of blood; the differential count was normal. Roentgenologic examination of the thorax by stereoscope showed a large tumor mass just below the left hilus with enlargement of hilar glands. Nodular areas of increased density in first and second interspaces and a fine disseminated infiltration of both lungs were also noted.

Bronchoscopic examination showed the mucosa of the anterior wall of the main branches somewhat infiltrated. Specimens scraped from the wall and examined microscopically were reported as "inflammatory tissue."

The diagnosis of metastatic carcinoma seemed most probable and the patient was given roentgen therapy. After the one course of roentgen therapy the patient went home with the suggestion that he undergo a course of antisiphilitic treatment with alternating courses of bismuth and mapharsen in conjunction with potassium iodide.



Fig. 1. Well-circumscribed mass in left lung and small nodule in right lung at level of second intercostal space on the right. These lesions disappeared following antisiphilitic treatment.

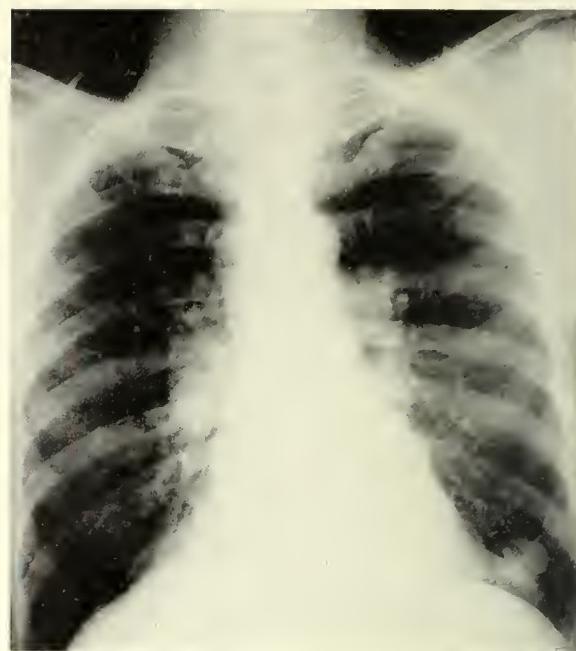


Fig. 2. Multiple nodules in lungs with enlargement of hilar and mediastinal shadows due to enlarged lymph nodes. Pathologic diagnosis of nodules reported as "inflammatory tissue compatible with diagnosis of syphilis."

A letter from his home physician after six months of mapharsen and bismuth injections reported marked improvement as evidenced by the roentgenogram of the thorax, which showed no residue of the lesion which was suspected of being a cancer. The patient now has no pulmonary symptoms and has gained 12 pounds (5.4 kg.).

Case 3. A sixty-two year old white man, married, came to the clinic on August 23, 1926, with the chief complaint of pain in shoulders and back, especially after exertion, which had been present four or five years but had become more severe in the past eight months. In December, 1925, he had had pneumonia with pleurisy. Since then he complained of increasing tiredness, slight cough, excessive sputum which was not blood-tinged, weakness and an occasional pain around the heart.

The physical examination revealed a thin, emaciated white man, whose pupils reacted slowly. Examination of the lungs revealed a percussion note which was impaired in the left apex. The breath sounds were within normal limits. The serologic reactions of the blood and spinal fluid were both strongly positive. The report of the roentgenogram of the thorax was as follows: "There is an infiltration of the left upper lobe, bilateral bronchiectasis, interlobar pleurisy. There is a peculiar type of pulmonary infiltration suggestive of syphilis."

After two courses of twenty injections each of the succinimide of mercury, there was striking improvement both roentgenographically and symptomatically. The patient gained 10 pounds (4.5 kg.) following the first course of mercury and four months later reported a gain of 35 pounds (15.9 kg.). In November, 1937, eleven years after his original admission to the clinic, the serologic reactions were reported as negative, roentgenogram of the thorax was reported as negative and he had no pulmonary symptoms.

The treatment for syphilis in this case was limited to the use of mercury only, in an effort to avoid any "nonspecific" benefits that might follow the use of arsphenamine.

Case 4. A fifty-nine year old man came to the clinic on August 11, 1941, complaining of a chronic cough for more than a year with expectoration of a half cup of blood-tinged sputum daily. He had dyspnea on mild exertion and a constant dull pain in the midsternal region associated with some hoarseness. No loss of weight or night sweats had been noted. The serologic tests of the blood, including the Kline, Kahn, Hinton and Kolmer, gave strongly positive results, but the spinal fluid examination gave negative results. Repeated examinations of the sputum were negative for bacilli of tuberculosis. The roentgenogram of the thorax (Fig. 2) was reported as follows: "Multiple nodular masses in both lung fields, suggestive of gummatous infiltrations."

In view of the findings the patient was urged to undergo a course of antisiphilitic therapy with mapharsen and bismuth; however, he returned home where he was given intensive roentgen therapy to the thorax for a period of many months with no improvement in cough, pain and dyspnea. No antisiphilitic treatment was given. In December, 1943, after a coma of twelve hours the patient died.

The postmortem findings were as follows: gross subacute fibrinous pericarditis, bilateral pleural effusion, extensive bilateral adhesions, multiple pulmonary tumors, atelectasis of the left lung, chronic mucopurulent bronchitis, chronic cholecystitis with cholelithiasis, radiation pigmentation of the thoracic wall, left chronic nephropathy and chronic cystitis.

On histologic examination the tumors were reported as chronic granulomas compatible with gumma.

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Book Reviews

The Marihuana Problem, by the Mayor's Committee on Marihuana. Lancaster, The Jacques Cattell Press. 220 pages; 1944; \$2.50.

In addition to the sociological investigation carried on by the committee from the New York Academy of Medicine appointed by Mayor LaGuardia of New York City, another group of smokers was studied in the clinical laboratory to determine the physical and psychological effects of the drug. As such, the book will be appreciated by physicians. The mayor calls it a basic contribution to medicine and pharmacology.

Each of three foundations donated \$7,500 for the survey, the Michael Friedsam Foundation, the New York Foundation and the Commonwealth Fund. \$20,000 of the total was devoted to the clinical study, the financial supervision of which was undertaken by the Research Council of the Department of Hospitals. Dr. Karl M. Bowman directed the medical and psychiatric section of the study, Dr. David Bowman the psychological part. Pharmacological labors were performed at Cornell University.

In the clinical study, the committee investigated the actual effects of the use of marihuana—watched for mental confusion, and checked the smoker's feeling of prolongation of time and space and on his sexual desires or phantasies as they occurred. Comparisons were made between the effect of the drug on users and non-users. The subjects were men and women volunteers.

From a medical point of view, the smokers were checked on such symptoms as the contagiousness of laughing and joking; difficulty in focusing; feeling of lightness, heaviness, dizziness; dryness of the mouth and sensations of floating.

Other tests checked organic and systematic functions of the human "guinea-pigs"—their circulation, pulse rate, blood pressure, blood morphology, and reactions on the kidneys, liver and gastro-intestinal tract. Checks were made also on hand-steadieness, strength of grip, and hand-and-foot reactions.

Atlas of the Blood in Children, by KENNETH D. BLACKFAN, M.D., and LOUIS K. DIAMOND, M.D., with illustrations by C. MERRILL LEISTER, M.D. New York: The Commonwealth Fund; 320 pages with indices and 70 illustrations. 1944. \$12.

This atlas is one of the finest publications in the field of pediatrics. The book is divided into two parts, namely a section on the description of blood diseases in infancy and childhood with case reports, and a portion that is devoted entirely to illustrations in color of the blood cells in normal and in pathologic states in children. A fairly complete knowledge of many diseases affecting the blood, particularly with regard to individual variations in reaction, changing symptoms, course, prognosis and effective therapy is furnished in such a way that the reader is sure that he is receiving the best information. Add to this the colored plates and one cannot help but recommend this book most highly for the general practitioner and the specialist interested in pediatrics and hematology.

The Psychiatric Novels of Oliver Wendell Holmes, by CLARENCE P. OBERNDORF, M.D. New York: Columbia University Press. 268 pages, 1943, price \$3.

Oliver Wendell Holmes was one of the most versatile doctors of all time. That is the primary reason for his having been so variously appraised. To medical men he is the first American doctor to have discovered and preached that doctors and midwives were mainly responsible for puerperal fever. (Semmelweis of Vienna has been usually hailed as the hero of this discovery, but although he won immortality through being martyred by his professional brethren, the luckier Holmes published his "On the Contagiousness of Puerperal Fever" four years before

the Austrian's paper appeared). To college students Holmes is a professor who, way back in the last century, wrote mildly amusing verse and dated essays; to a recent biographer of his son he was the vain and jealous father of a great chief justice. Few today know him for a novelist, and still fewer as a psychologist who practiced what we now think of as Freudian psychology, long before Freud was out of knee pants.

It is as a psychologist that Dr. Oberndorf, psychoanalyst at Columbia, resurrects him for us in this study. We are first, in an introduction, given an interesting account of the man Holmes and his times; then follow the three "medicated novels"—*Elsie Venner*, *The Guardian Angel*, *A Mortal Antipathy*—which have been abridged by him to from one-eighth to one-tenth of the original texts, to which he has added copious interpretations, notes and comments. It is Dr. Oberndorf's contention that Holmes, suspecting that as a professor of anatomy his psychiatric views would be derided by his colleagues, chose to present them as fiction. Certainly judged by present standards they are pretty poor novels, but the reader will agree with Dr. Oberndorf that they stand "as excellent testimony to Holmes' medical keenness, his knowledge, and profound psychiatric understanding," and that he was indeed a "precursor of Freud." For back in the 1850's this doctor talked of "the unconscious" and displayed an amazing awareness of free association, the dangers of early psychic trauma and of parent-child relations, recognized and treated complexes and neuroses that even professors of psychology failed to recognize until Freud years later had named them for the world.

Everyone interested in psychiatry and medical history should find this unusual book stimulating reading. Not only is it a scholarly analysis but it shows up the little Boston doctor, prolific writer of humorous verse, philosopher and "autocrat," to have been a truly creative physician of men's souls no less than their bodies.

The Doctor's Job, by CARL BINGER, M.D.; New York: W. W. Norton & Co., Inc., 1945. Price \$3.00.

Here is a book of which every doctor might well buy two copies; one to keep in his waiting-room (chained like a Gideon Bible), another to lend to his favorite patients. The doctor's job as conceived by Dr. Binger is to bring "trained human understanding" of health to the sick person. There have been many books by and about doctors and their patients but we know none that deals so sympathetically with this intensely human relationship, none that says so much or so wisely of what every layman should know about the medical profession—its accomplishments and limitations—nor explains so clearly the "new" mind-body conception of disease, new today, but taught by Hippocrates more than two thousand years ago. In his discussion of psychosomatic medicine Dr. Binger clarifies much of modern psychiatry. In untechnical terms he shows how "the splinter in your soul" may complicate, even inaugurate certain diseases, and how mind-reading used unconsciously by skilled doctors of the past, has now become an invaluable tool requiring as delicate handling as the surgeon's knife.

But the psychological feature of the job is but one part. In other chapters the layman receives much practical information to help him greatly in his orientation. He is told for example how to choose a doctor, why and when a specialist, the meaning of "medical ethics," told frankly of the doctor's dilemma in placing a price on his services and of the troubled subject of medical economics in general.

"The essence of good medical care," Dr. Binger says, "depends upon a closer relationship between the patient and a doctor with a healing personality, one who cares about helping him and has at his disposal all the technical facilities of twentieth-century medicine. Neither by itself is sufficient." Laying all his cards on the table he blows away clouds of superstitions and shibboleths. And he does it all with the art and grace of an Osler.

The doctor may not find anything "new" in this book but the serene writing and quality of the author's mind cannot fail to hold his interest; the intelligent lay reader for whom it is primarily written, will close the book with a renewed respect and understanding of himself and of his own doctor. Of course, he may wire Dr. Binger for an appointment!

American Student Health Association Newsletter

CURRENT LEGISLATION

On February 7, 1945, Representatives Hartley and Weiss introduced in Congress a bill, H. R. 2045, entitled: *A Bill to establish a U. S. Commission for the promotion of physical fitness and making an appropriation for such commission.*

Excerpts from declaration of intent of the bill:

"A high degree of physical fitness is essential for the existence of our nation . . ."

"Failure to provide adequate physical training since World War I has accounted for, in large measure, weakness in physical condition and lack of motor skill and has contributed to great loss of life and materiel, and to needless expenditure of funds."

The bill provides for a Commission on Physical Fitness composed of: two senators appointed by the president of the senate; two members of the house appointed by the speaker of the house; five persons named by the President, of which one man and one woman shall be professionally trained in physical training, and one shall be expertly qualified in the conduct of competitive athletic sports.

Duties of the commission shall be to promote the physical fitness of the inhabitants of the United States through physical training, competition in all athletic sports, camping and kindred activities.

"to develop and maintain an efficient motor fitness . . ." "encourage activities relating to physical development . . ." "encourage provision of facilities for conduct of physical fitness activities." . . . "encourage the development of physical fitness through amelioration of physical defects by physical exercise."

Funds: Congress will appropriate \$25 million for the purpose of aiding the states in providing the program in the fiscal year July 1, 1945 to July 1, 1946, and thereafter such sums as the commission recommends and congress may determine; after the first year the states will have to match federal appropriations.

Publicity on this bill called attention to the great number of selective service rejections because of physical defects. Probably less than 2 per cent of such rejects could have been raised to selective service standards by the best type of corrective physical training.

Does this bill fulfill its avowed purpose, of providing means to improve the static health of the population? Selective service acceptances are on the basis of health and freedom from physical defects rather than on the basis of motor skills.

Would it not be better to delay introduction of such legislation until an over-all program for health improvement and maintenance can be agreed upon?

Members are urged by President Canuteson to write their representatives in congress asking for copies of the bill, and then to express their opinions as to whether they agree or disagree with this bill.

DIGEST OF MEDICAL NEWS

DR. OLIVER E. BYRD

Leland Stanford University

A SCHOOL SPONSORED EPIDEMIC OF MUMPS

Milton I. Levine, M.D., of the Cornell University Medical College reports on the results of a sponsored epidemic of mumps in a private school in New York.

Among the so-called contagious diseases of childhood, mumps has one quality peculiar to itself—that of being less severe in complications before puberty than after this period.

It might seem reasonable to attempt to expose children to cases of active mumps in order that they might develop an immunity prior to the onset of adolescence.

The present paper reports the results of such an attempt in a private school of 161 children during the mumps epidemic in New York City in the early months of 1942. This school* had for the twelve previous years been remarkably free from mumps.

On January 22, 1942, one of the children developed mumps and soon exposed others.

The following letter was sent immediately to all parents:

"Dear Parents:

At the present moment there are a number of cases of mumps in the school. Several of the children have brothers or sisters in other classes not exposed.

With all other contagious diseases our policy is to exclude these children exposed at home to avoid further possibility of contagion.

However, since mumps is an extremely mild disease and almost devoid of any complications before puberty, and may be at times very painful and result in serious complications after puberty, I feel it would be inadvisable to do anything to avoid exposure to this disease, unless there is a particular reason.

We would like to know if you and your child's physician are in agreement."

This letter brought forth the unanimous approval of the parents, with only one questioning note from a pediatrician who felt that no child should ever knowingly be exposed to a disease, but consenting to the plan if most of the parents agreed.

Accordingly, no restrictions were placed on exposed children, with the exception of the classes of children aged 3, 4, and 5 years.

Within a period of three months 62 children (54.4 per cent) from a total of 114 susceptibles in the upper eight classes developed the disease. Four children in the lower three classes contracted the disease from their brothers or sisters.

Of the 66 children who developed the disease, 6 developed complications. The parents of 4 children developing mumps encephalitis were reassured that there would be no after-effects.

Two other complications which developed were a moderately severe inflammation of the testicles in a boy aged 12, and a possible inflammation of the pancreas in a child of 8 years.

When the epidemic subsided a questionnaire was sent out requesting complete information on the children who contracted the disease, with an added question as to whether any other members of the family contracted the disease. The final analysis revealed that beside one teacher, who was incapacitated with the disease for two weeks, 10 parents suffered from the infection, a possibility which was completely overlooked when the plan was suggested.

It is doubtful if any further epidemics will be sponsored by the school.

Reference. Levine, Milton I.: "A Sponsored Epidemic of Mumps in a Private School," American Journal of Public Health, 34:1274-76 (No. 12), December 1944.

CHEESE AND TYPHOID FEVER

Karl F. Meyer, M.D., of San Francisco, California, reports that during 1944 the California State Health authorities were greatly baffled by an increased incidence in four counties of typhoid fever (77 cases, resulting in 2 deaths). Painstaking and diligent investigation disclosed that, common to all cases, was the consumption of unpasteurized cheddar cheese of the unripened variety. Invariably the members of the families who were consumers of large quantities were affected, while those who consumed it in the cooked form were not attacked.

Actually, a number of epidemics of typhoid fever have been caused by infected cheese. In recent years, our good neighbors in Canada have had their share of typhoid fever caused by hard rennet cheeses of the cheddar variety. As early as 1932 an outbreak of 627 cases, with 57 deaths occurred in the St. Maurice valley.

In 1925, an epidemic of 29 cases of typhoid fever with 4 fatalities occurred in Minnesota. The evidence proved a carrier in the family of one of the contributing patrons of the cheese factory as the source of infection. As the creamery had many requests for the fresh cheese, the product was distributed as early as ten days after making, instead of holding it to ripen as is usually done. Epidemiological data, furthermore, showed that the typhoid bacilli had lived in the cheese approximately 63 days. At least two cheese-borne epidemics of typhoid fever have been observed in New York State.

Indiana experienced in 1944 a typhoid epidemic of 225 proved cases and 12 deaths traceable to the eating of green cheese made from unpasteurized milk.

All the evidence on cheese-borne typhoid fever shows the infective agent invariably reached the cheese through the use of raw milk accidentally contaminated by a carrier or an ambulatory case. Adequate pasteurization of the milk, or pasteurization at any stage in the cheese making process, should render fresh, unripened cheese safe.

Studies show that when 1,000 to 600,000 typhoid bacilli are worked into cheeses, infective organisms are retained for a period of three months when held at 58 to 60° F. At lower temperatures of 40 to 42° F., the typhoid organisms could be isolated for six months and, in fact, in the majority of the cheese specimens, for ten or more months.

Reference. Meyer, Karl F.: "Cheese-borne Epidemics of Typhoid Fever," California and Western Medicine, 61:137-39 (No. 3), September 1944.

THE CONQUEST OF BOVINE TUBERCULOSIS

H. R. Smith, General Manager of the National Live Stock Loss Prevention Board, says that cattle in the United States first became infected with tuberculosis from importations of breeding cattle from Europe, long before we had the tuberculin test. The disease spread until, in 1916, of all cattle slaughtered under Federal inspection in the United States 2.35 per cent were retained for tuberculosis (lesions found on postmortem examination), the percentage infected being much higher.

The disease was transmitted from cattle to swine through infected milk and droppings. In 1917, 40,746 cattle and 76,807 hogs were condemned for tuberculosis.

Appropriations were made by Congress, state legislatures, and county boards which were increased each year until 1935 when a total of \$26,792,179 was spent in one year to test cattle for tuberculosis and to pay owners for livestock condemned because of this disease.

Since 1935 expenditures for this purpose have decreased greatly as the infection has been reduced in cattle.

In 1943 the incidence of the disease in all cattle had been reduced 98 per cent, but in hogs much less because of the prevalence of tuberculosis in poultry (avian) which is readily communicated to hogs, but rarely to cattle.

The decline in human tuberculosis that has been explained in part by the eradication of this disease in cattle is shown in the following table. The decrease in glandular, bone, and abdominal tuberculosis death rates is probably closely associated with the decline of this disease in cattle.

Year	Human Death Rates for:	Cattle Tuberculosis Forms	Tested for Tuberculosis	Tuberculous Cattle Slaughtered	Per Cent Slaughtered Cattle Retained for T.B.
1900	180.5	21.4			.88
1902	162.6	21.9			1.27
1904	176.2	24.5			1.42
1906	155.6	24.6			1.57
1908	144.0	23.6			1.57
1909	137.7	23.4			1.98
1910	136.0	24.3			2.02
1911	132.7	26.5			1.98
1912	125.0	24.7			2.11
1913	123.0	24.8			2.35
1914	123.5	23.7			1.76
1915	123.5	22.8			1.76
1916	119.9	22.2			1.76
1917	124.6	22.5	20,101	645	1.76
1918	128.6	21.4	134,143	6,544	1.80
1919	107.5	18.1	329,878	13,528	1.57
1920	97.0	17.0	700,670	28,709	1.62
1921	85.6	13.3	1,366,358	53,768	1.62
1922	84.3	12.1	2,384,236	82,569	1.76
1923	81.3	11.5	3,460,849	113,844	1.75
1924	78.0	11.7	5,312,364	171,559	1.56
1925	75.9	10.8	7,000,028	214,491	1.51
1926	76.6	10.7	8,650,780	323,084	1.41
1927	71.4	9.5	9,700,176	285,361	1.15
1928	70.3	9.0	11,281,490	262,113	1.04
1929	67.6	8.4	11,683,720	206,764	1.00
1930	63.4	8.1	12,845,871	216,932	.75
1931	60.7	7.5	13,782,273	203,778	.62
1932	56.4	6.5	13,443,557	254,785	.49
1933	53.6	5.9	13,073,894	255,096	.42
1934	51.2	5.4	15,119,763	232,368	.36
1935	49.8	5.1	25,237,532	376,623	.24
1936	50.6	5.0	22,918,038	165,496	.18
1937	49.0	4.6	13,750,308	94,104	.14
1938	48.9	4.3	14,108,871	89,359	.11
1939	42.6	3.9	11,186,805	60,338	.10
1940	41.6	3.7	12,222,318	56,343	.08
1941	40.8	3.7	12,229,499	40,702	.07
1942	39.6	3.5	10,983,086	28,008	.061
1943			9,308,936	17,167	.048

Reference. Smith, H. R.: "Bovine Tuberculosis in the United States," American Review of Tuberculosis, 50:520-33, (No. 6), December 1944.

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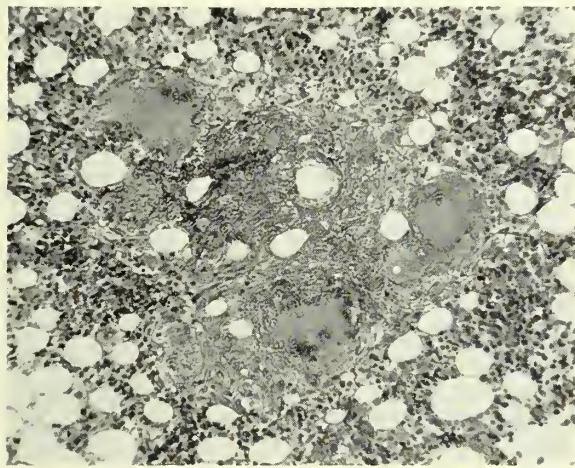
DRAMATIC ADVANCES ON THE TUBERCULOSIS FRONT

Until recently the diagnosis of *early* generalized miliary tuberculosis was practically an impossibility. Symptoms when present are similar to those of other diseases like typhoid fever. Physical signs, including x-ray film inspection of the chest, are nearly always absent. The tissues may fail to react to tuberculin if they have been desensitized by the overwhelming condition. Tubercle bacilli are rarely found in the sputum or gastric washings. Indeed, 50 per cent or more of the diagnoses in the past have been possible only at postmortem. With chemotherapeutic agents now becoming a strong possibility it is of extreme importance that the physician be able to detect this disease *early*. Apparently this has become a reality through the splendid contribution of Schleicher of the Minneapolis General Hospital, who through microscopic examination of bone marrow from the sternum

is able to demonstrate the presence of miliary tubercles (illus.) while the disease is in its early development. The case reports presented by Peterson and Canfield emphasize the importance of delicate diagnostic aids in differentiating between generalized miliary tuberculosis and other serious conditions.

The papers by Boynton, Jordan, and Harrington show the effectiveness of tuberculosis control measures based upon the well-known fundamental procedures; namely, the tuberculin reaction to detect those with primary tuberculosis, x-ray films of the chests of adult reactors to find those with gross lesions as early as they cast shadows visible to the naked eye, periodic x-ray inspection of the chests of all other adult reactors to find those in whom such lesions subsequently develop, careful examination including laboratory and clinical procedures of those who have x-ray shadows to determine which are due to tuberculosis, isolation and treatment of all contagious cases of

tuberculosis, and complete control of tuberculosis among the animal herds, particularly cattle. By these methods practiced even in a somewhat haphazard manner throughout the state of Minnesota Boynton has shown that in thirty years the mortality from tuberculosis among all children of fifteen years of age has been reduced 88 per cent and in infants under one year of age, 93 per cent. Jordan, who has carried out these fundamental control procedures in a well-organized manner, has whole schools in which not a single child is infected with tubercle bacilli. For the first time in the history of this country a nation-wide tuberculosis control program is being developed by the United States Public Health Service. The paper by Hilleboe and Newitt shows in part the scope of this laudable undertaking. Thus the goal attained by the veterinarians and their allies described by Dr. Wight is now in sight for control of tuberculosis in man.



Human Bone Marrow, Sternum. Histologic section of a gross marrow unit (aspirated during life) showing military tuberculosis. Magnification x 180. (Courtesy Dr. E. M. Schleicher.)

For many years the JOURNAL-LANCET has encouraged routine examinations for tuberculosis in the offices of all practicing physicians. Dr. Hacker's paper shows how effectively this can be done. The excellent article on tuberculous cervical adenitis by Dr. Cohen will remind many physicians now practicing of the time when this form of the disease was extremely prevalent. Now it is relatively rare in this country.

Syphilis of the lungs has been in a state of considerable confusion in the minds of physicians for many years. In this issue Dr. O'Leary has clarified the subject. Apparently syphilis and tuberculosis pursue almost parallel courses in the human body in several respects. They are both caused by specific organisms; both begin with the development of primary lesions which are soon brought under control by the natural defense mechanism; organ-

isms from the primary lesions may live over long periods of time in the human body; significant clinical lesions (tertiary) later appear in about one-third of persons infected with spirochaeta pallida and probably an equally high percentage of persons infected with tubercle bacilli later develop lesions (reinfection type) of clinical importance. The medical profession and its allies have won a significant victory over syphilis. It only remains to apply our present knowledge to win a similar victory over tuberculosis.

J. A. M.

CANCER CONTROL

The Center for Continuation Study at the University of Minnesota in cooperation with North Dakota State Medical association, Minnesota State Medical association, North Dakota State department of health, North Dakota branch of the American Cancer society, and the Minnesota Cancer society conducted two cancer courses during February, 1945. The course for physicians was attended by over 90 practitioners. The course for lay workers which followed was attended by nearly 100 women. This unique demonstration of interest in cancer marks a new high in cooperative effort. For a long time it has been felt that both physicians and lay persons should know more about the beginning stages of cancer and the various methods of treatment. Great progress has been made in this field, and the outlook is more encouraging than it was a few years ago. Physicians who came to teaching centers in the past saw cancer patients in the late stages of the disease, and little hope was held out for their cure. Today, education of the public and profession brings patients in earlier so that physicians attending clinics in teaching centers now see a great many patients who were treated several years ago who are still free of the disease. There has also been outstanding development in cancer research. At the University of Minnesota the project was made possible by special state appropriation and by a gift of the Citizens Aid society. The Dight Institute at the University of Minnesota is carrying on special genetic studies of human cancer. The cancer group is admittedly a pressure group. It is an organization of physicians and lay persons who wish to see something done about the cancer problem. When their purpose is achieved, there will cease to be a need for them. At the present time the Cancer society is making an appeal for funds. Physicians should contribute freely to this campaign, for most of the money will be allocated for research. In addition, the educational campaign will be continued. Dressings will be made for indigent cancer patients, and programs of instruction will be carried on in the schools.

WILLIAM A. O'BRIEN, M.D.

Medicines sufficient for the needs of 1,000,000 school children are being sent by the American Junior Red Cross to schools in Yugoslavia, Greece and Belgium. The medicines are contained in kits each of which is designed to serve 400 children and each contains 30 standard medical items.

. . . MEET OUR CONTRIBUTORS . . .

We introduce this new column not as a publicity "stunt", not to boast of the distinctions of our writers, proud as we are of them, but to satisfy in part a commendable curiosity. Who has not thought after reading an interesting and informative paper "I'd like to know more about this chap; he sounds like the real thing?" But our idea was no sooner born than came the spectre of paper shortage and we found ourselves obliged to pare down to the barest skeleton what we had hoped to make a true flesh-and-blood paragraph. So we start with an apology. C'est la guerre!

Dr. Jay Arthur Myers, Minneapolis, Minnesota, now president American College of Chest Physicians. You all know him as our guest editor for this issue and chairman of the JOURNAL-LANCET's editorial board. A graduate of the University of Minnesota where he is now professor of medicine and preventive medicine and public health, he has practiced in Minneapolis for 25 years, his specialty diseases of the chest. He has held so many offices and belongs to so many societies we can't possibly list them. For his work in the tuberculosis field he is, known throughout the land.

Dr. Herman E. Hilleboe, a native son of North Dakota, and another of Minnesota-trained distinguished physicians, is now chief of the tuberculosis control division, bureau of state services U. S. Public Health Service. After taking all the medical degrees Minnesota could give him he went to Johns Hopkins and became a Master of Public Health. The U.S.P.H.S. sent him abroad to study tuberculosis control in four European countries and later made him chief of their tuberculosis control division with rank of medical director. An entire page would be required for the offices he has held and the papers he has published.

Dr. Willard Everett Peterson was graduated at the University of Minnesota in 1943. He is at present a medical fellow at the Minneapolis General hospital.

Dr. T. L. Harrington has practiced in Milwaukee, Wisconsin, since 1900. He received his bachelor of science degree at the University of Wisconsin, his medical one at the University of Pennsylvania. Tuberculosis is his specialty and primary interest.

Dr. Guy L. Hacker has lived and practiced in Dallas, Texas, for 11 years during which he has made tuberculosis history at the Freeman Memorial clinic. His specialty is pediatrics of which he is associate professor at Dallas' Southwest Medical Foundation.

Dr. Sidney Granville Clayman of San Haven, North Dakota, is a graduate of the University of Michigan, class of 1939, who has specialized in tuberculosis. He is staff physician of the North Dakota State Tuberculosis sanatorium.

Dr. Alexander E. Wight is the head of the tuberculosis eradication division of the bureau of animal industry, U. S. Department of Agriculture, where he has been employed since 1898. He was trained for this work at the Harvard Veterinary college and has the degree of M.D.V. His specialty is cooperative animal disease control work. He has served as president of three societies, the A.V.M.A., the U.S.L.S.S., and the D.C.V.M.A. Since 1917 he has been chief of the tuberculosis eradication division.

Dr. Ruth E. Boynton, a graduate of the University of Minnesota, is director of the Students' Health Service at the university. She has been both president and secretary of the American Student Health association and has served as president of Minnesota State Board of Health. She is the present acting head of the university's school of health.

Dr. Sumner S. Cohen of Minneapolis, Associate in Medicine at the University of Minnesota and assistant medical director at Glen Lake sanatorium, has practiced in his home town for 17 years. During this time, he specialized in chest diseases and has served as secretary-treasurer and president of the Minnesota Trudeau Medicine Society.

Dr. Paul Arthur O'Leary, product of Dartmouth and Long Island colleges and a 1915 licensee, has a hatful of memberships and affiliations, American and foreign, and has been an officer, consultant, committee chairman or delegate of half of the thirty-odd bodies to which he belongs. A past president of the American Academy of Dermatology and Syphilology (1938), Dr. O'Leary is currently a member of the board for outlining treatment of syphilis and co-author of procedure for neurosyphilis of the Army and Navy. For seventeen years he has been a professor of the Mayo Foundation, graduate school of the University of Minnesota, and has found time to write or collaborate in 250 articles as well as to be the co-author of *Modern Syphilology*.

Oliver Erasmus Byrd has been a health educator at Stanford University for the past eight years. From his Alma Mater he has received his bachelor and master of arts degrees and that of Doctor of Education. He is now taking a medical training there in order to supplement his work in health education. He is editor of the annual *Health Instruction Yearbook* published by Stanford.

Dr. William Austin O'Brien, serving his twenty-first year at the University of Minnesota, is president of the Minnesota Cancer Society and is the "mouthpiece of medicine" radiowise on station WLB and as a director of the medical section of the center for continuation study at the medical school. He is a graduate of St. Louis University, St. Louis, Missouri, and specializes in pathology, preventive medicine and public health with the last of these in capital letters. The genial doctor is the trade-mark of the school of medicine on the Minnesota campus.

The first edition of the U. S. Treasury's *Surplus Reporter* was issued November 29. The purpose of this and subsequent issues is to inform interested purchasers of commodities such as furniture, hardware, office supplies, etc., of what articles the Treasury has to sell and from where. Hospitals may find it much to their advantage to get on the Treasury's mailing list. The Regional Office of Surplus Property for Minnesota, North and South Dakota and Wisconsin is at 209 LaSalle St., Chicago; for Iowa and Nebraska, 2605 Walnut St., Kansas City; for Montana, Idaho, Oregon and Washington, 2005 Fifth Ave., Seattle.

News Items

The Grand Forks District Medical Society held its February meeting February 21, 1945. Dr. G. A. Abbott, chemistry department, University of North Dakota, read a paper: "Toxicology and its Relation to Crime Detection."

Bill H. R. 491 which Congressman William Lemke introduced, together with the telegram which was sent to Mr. Lemke, and his answers, were read and ordered published in JOURNAL-LANCET. They follow:

WM. LEMKE, REPRESENTATIVE, WASHINGTON, D. C. — GRAND FORKS DISTRICT MEDICAL SOCIETY REGARDS YOUR H. R. 491 AS DETRIMENTAL TO MEDICAL IMPROVEMENT. IF CARRIED WOULD PREVENT SUCH PROGRESS AS WAS MADE BY THE DEVELOPMENT OF INSULIN FOR DIABETES. SURELY SUCH IS NOT YOUR INTENT. WE PROTEST IN STRONGEST TERMS YOUR SPONSORSHIP OF SUCH A BILL.

(THE BILL) — H. R. 491

79th Congress
1st Session

IN THE HOUSE OF REPRESENTATIVES
January 3, 1945

A BILL

To prohibit experiments upon living dogs in the District of Columbia and providing a penalty for violation thereof.

1 Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the passage of this Act it shall 2 be a misdemeanor for any person to experiment or operate 3 in any manner whatsoever upon any living dog, for any 4 purpose other than the healing or curing of said dog, in the 5 District of Columbia.

8 Sec. 2. That any person convicted of a violation of this 9 Act shall be sentenced to pay a fine of not less than \$100 10 nor more than \$500, or to undergo imprisonment for a 11 term of not less than three months nor more than one 12 year, or both such fine and imprisonment.

13 Sec. 3. That all Acts or parts of Acts inconsistent 14 herewith are hereby repealed.

Reply to North Dakota Medical Association:

January 22, 1945

Received your letter and note what you say about H. R. 491.

I wish to thank you for giving me your opinion on the subject. I do not believe it is necessary to torture dogs who are saving the lives of our sons on foreign battlefields in order to forward science. Many things that we thought in the past were essential have proven not so vital.

We used to believe people and thought we were saving lives and in fact we lost. In the early days it was considered unhealthy to have a bath and laws were passed prohibiting people from having bath tubs and from using them during certain months of the year. I am sure that medical science and development will lose nothing by not putting dogs in ovens and testing how much heat they can stand.

H. R. 491 has reference only to dogs and does not include white rats, guinea pigs nor monkeys that are now being used for experimental purposes.

I assure you that I appreciate getting your viewpoint and that if there are hearings on H. R. 491 the medical profession will be afforded ample opportunity to be heard and then all the pros and cons and the necessity for this cruelty will be fully considered by the committee.

(Signed): WILLIAM LEMKE.

The North Dakota legislature has passed a bill establishing a medical center at University of North Dakota. The bill enables the university to accept federal grants or donations from private agencies. Sponsors of the bill claim it will make possible a four-year medical course and expansion of the state's health and welfare services.

Dr. S. A. Slater, superintendent of the Southwestern Minnesota sanatorium since 1919, will be vested with the honorary degree of doctor of science and at the same time receive the Phi Beta Kappa key from his alma mater, the University of Richmond, Va., on April 27. Dr. Slater is a nationally recognized authority on tuberculosis and public health.

The twelfth E. Starr Judd lecture was given by Dr. Allen O. Whipple, professor of surgery at Columbia university, Tuesday evening, April 10, 1945, at 8:15 in the Museum of Natural History auditorium. Subject: "The Problem of Portal Hypertension in Relation to Hepato-Splenopathies." The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

The offer of the Variety Club to contribute either \$160,000 or \$165,000 toward construction of a heart hospital on the University of Minnesota campus was accepted by the Board of Regents at its March meeting after recommendation by President Coffey and Dr. Diehl, dean of medical sciences. The offer is predicated on the possibility of obtaining federal funds. The Variety club also offered to contribute \$25,000 a year toward the support of the hospital and expressed an intention to increase that amount.

The Montana and the North Dakota State Medical Associations' Annual Meetings have been cancelled at the request of the ODT. The probability is that meetings of the Houses of Delegates for both states will be announced later.

The 44th semi-annual meeting of the Montana Academy of Oto-Ophthalmology was held at Great Falls, February 18-19, 1945. The subject of "Contact Plastic Lenses" was discussed by Al Anderson with the aid of moving pictures and slides. Dr. G. A. Lewis of Roundup was elected president and Dr. Fritz D. Hurd of Great Falls, secretary.

At the recent meeting of the Montana Public Health League a constitution and by-laws were adopted and future league activities were planned. Dr. J. M. Flinn who represented the Montana Medical association announced the objective of the league was largely to raise health standards through education of the public to an appreciation of the true significance of the professions of medicine, nursing, dentistry and pharmacology, and to the necessity of supporting laboratories, etc., and of opposing objectional legislation. The meeting was attended by representatives from eleven Montana cities.

Emil Hanson, superintendent at the hospital at Fergus Falls, has accepted the position of superintendent of the Winona general hospital succeeding George Edblem, who has taken a similar position at the Swedish American hospital at Rockford, Illinois.

New York City has started one of the largest mass movements for the prevention and cure of civilian tuberculosis yet seen in this country. All school staffs—public, private and parochial schools—are to be x-rayed with the board of education granting leaves of up to two years for teachers found suffering from active tuberculosis. It is expected that the examinations at 500 a day will be completed by summer. The health department estimates that of the 60,000 persons to be examined no more than 200 cases will be found suffering from the disease.

On the basis of data available from different parts of the country it is clear that there was a definite increase in the death rate from tuberculosis in many of the industrial cities in the north-central and northeastern part of the country last year, with a normal decrease in other sections. In Massachusetts the increase has been largely among the older age groups with excess among males. A larger number than usual of tuberculosis patients are refusing sanatorium treatment and a certain number are leaving the sanatoriums, against advice, to take jobs at the high wages now available.

The Upper Mississippi medical society (Minnesota) met in Brainerd February 10 and heard Dr. Haven Emerson of the New York City board of health give a paper on health problems. Officers elected were Dr. J. A. Thabes, Jr., president, Dr. A. Lenarz, vice president, and Drs. R. D. Hanover and G. I. Badeux, secretary-treasurer.

Dr. and Mrs. Estrem of Fergus Falls, Minnesota, have four sons, two of whom are physicians, all of whom are in service. Dr. Robert Estrem is in the medical corps in France, Dr. Ralph Estrem has been assigned to act as resident at Ancker hospital, St. Paul, until July when he goes back into the army. Lieut. Paul Estrem, a navigator and bombardier, has been reported missing in action over Germany as of December 23.

Dr. R. R. Randall of Miles City was elected president of the Southeastern Montana medical society at its annual meeting held at Terry in January. Other officers elected were Dr. B. R. Tarbox of Forsythe, vice president, Dr. I. J. Bridenstine of Terry, secretary.

Dr. Glenn Carmichael of Butte, Montana, has been called to the service. He has been assigned to the Army-Navy hospital at Hot Springs, Arkansas, and will be chief of the women's division.

Among the bills signed recently by Governor Sharpe of South Dakota is one that prohibits county hospital discriminations against practitioners other than M.D.s. This sounds ominous, and a little education of South Dakotans would seem to be in order.

Dr. R. M. Ferguson, senior assistant surgeon (reserve) in the U. S. public health service, has assumed his duties as director of the Sioux Falls health department. Dr. Ferguson comes from Joplin, Missouri, where he was health officer of Jasper county.

Recently returned from Brazil is Dr. Eugene Kisch, associate in orthopedic surgery at the N. Y. Hospital for Joint Diseases, who was invited by the Brazilian society for tuberculosis to assist the Brazilian government in designing new tuberculosis hospitals.

Dr. W. L. Wallbank, superintendent of the North Dakota state tuberculosis sanatorium at San Haven addressed the Northwest district medical society at Minot March 22 on the subject "New Developments in the Home Care of Tubercular Patients." The meeting was held at St. Joseph's hospital, with the program in charge of Dr. Harmon Brunner. Dr. S. G. Clayman, a contributor to this issue, presented a clinical case at the meeting. He is a member of the American College of Chest Surgeons. Dr. Wallbank is a member of the advisory board of the National Trudeau society.

The public health service rank of Dr. Herman E. Hilleboe, also an April contributor, is medical director, which is the equivalent of colonel in the army or captain in the navy. Together with Dr. Russell H. Morgan, medical officer-in-charge of radiological section, tuberculosis control division of the United States public health service, Dr. Hilleboe is co-author of *Mass Radiography of the Chest*. The book includes administrative and technical information on the problem of all forms of radiography based upon experiences of the public health service over the last five years and Dr. Morgan's unpublished experimental work in radiography at the University of Chicago.

Dr. Laurence F. Flick, whose work in the cause of tuberculosis prevention culminated in the national effort under the auspices of the National Tuberculosis Association has been memorialized by his daughter Ella Marie Flick in a book, *Beloved Crusader*, published by Dorrance & Company of Philadelphia in 1944. It is, in effect, a 56-year record of the fight against phthisis.

Word has just been received that the Annual Meeting of the National Tuberculosis Association scheduled for Buffalo, N. Y., in June, has been cancelled on vote of the executive committee.

According to the Department of Commerce Bureau of the Census the number and percentage distribution of hospitals and sanatoria in this country in 1939 devoted to tuberculosis was as follows: Total number, 492 (6.8% of all hospitals). Government, 330 (18.8%). Non-profit, 111 (3.7%). Proprietary, 51 (2.0%). From the same source it is disclosed that the death rate from tuberculosis per 100,000 estimated population as compiled by states that register such figures was (out of a total of 1,719.1 for all causes) in 1900, all forms of tuberculosis 194.4, tuberculosis of the respiratory system 174.5, other forms of tuberculosis 19.9. In 1943, out of a total of 1,089.5 for all causes, tuberculosis in all forms was represented by 42.6, of the respiratory system by 39.1, other forms 3.4.

The American College of War Surgeons has deferred for the time being its 1945 series of war sessions, one of which meetings was to have been held in Milwaukee, on account of the armed services' demands on transportation facilities and hotel accommodations.

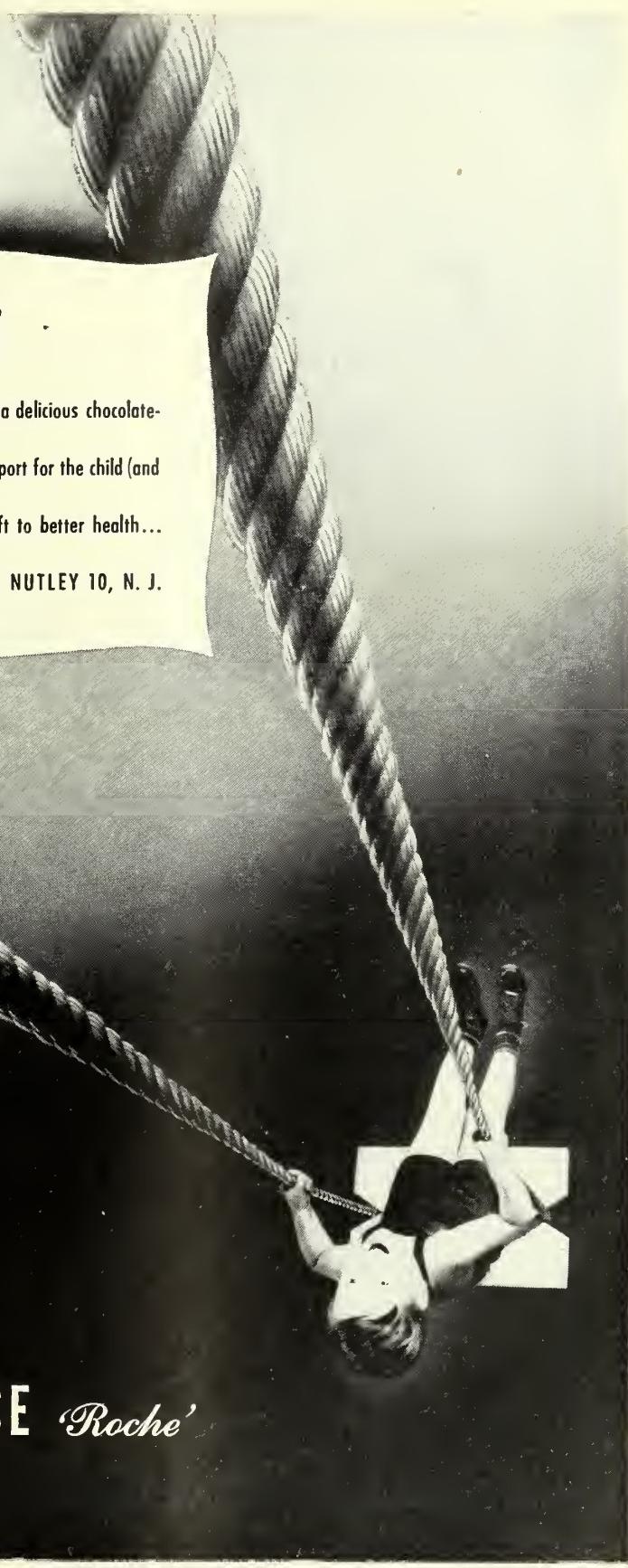
In a nation-wide broadcast, Dr. Irvin Abell, Louisville, Kentucky, chairman of the board of regents of the American College of Surgeons, stated that the development of surgery has reduced the death rate of war wounded in army and navy hospitals to three per cent against eight per cent in World War I.

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The American College of Chest Physicians, with a membership in twenty-three countries, has cancelled its annual meeting scheduled to be held at Philadelphia, June, 1945. The Executive Council of the College voted to hold a business meeting of the Board of Regents at Chicago, June 17th.

Necrology

Dr. John G. Thompson, 64, Helena, Montana, died at his home February 19. Dr. Thompson had practiced in this region for thirty-seven years.

Dr. Louis Ramaley, 72, St. Paul, Minnesota, died February 5, in Mounds Park hospital. Dr. Ramaley became a medical examiner for the City Health bureau in 1924 and served for 20 years.

Dr. A. A. Cameron, 51, Rainy River, Ontario, died suddenly on a Winnipeg street February 13. Dr. Cameron had been working for the army in Winnipeg for the past few months, and had recently moved to that city from Rainy River, where he was widely known.

Dr. Harlow N. Orton, 86, died in San Francisco recently. He practiced in Minneapolis for many years and retired in 1923.

Dr. A. L. Kyllo, 57, Superior, Wisconsin, health officer of that city, died at the veterans' hospital in Fort Snelling on February 18, after a sudden illness.

Dr. Erik Engson, 91, Lake Bronson, Minnesota, died at the Hallock memorial hospital on February 7.

Dr. Lewis L. Mayland, 74, Great Falls, Montana, died at a local hospital March 6, following a month's illness. Dr. Mayland was born in Minnesota, was graduated from its university and practiced in that state until 1910, when he went to Montana. He was active in local political circles and at one time was candidate for mayor of Great Falls.

Dr. Arthur Edward Smith, 65, Minneapolis, Minn., died in the Northwestern hospital February 16 from a carcinoma.

TWO DAHL PHARMACIES

JOSEPH E. DAHL CO., INC., operating Dahl's Exclusive Prescription Pharmacy, took over in 1941 what was formerly known as

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Advertisers' Announcements

COMPOUND SULFALLANTOIN SOLUTION SUGGESTED FOR EENT DOCTORS

In his book entitled, *Sulfonamide Therapy in Medical Practice*, the author, Dr. Frederick G. Smith, devotes several pages to an article by Dr. Joseph S. Stovin, which appeared in the *EENT Monthly* nearly two years ago and which always arouses great interest among specialists in that line.

Dr. Stovin's paper is on his experience with the proprietary Sulfallantoin manufactured by Schuylkill Chemical Company of Philadelphia. He states that he has used it in both powder form and in compound solution which he specified (Sulfallantoin, 4.0 gms.; Clorobutanol, 2.0 gms.; sodium chloride, 4.5 gms.; distilled water, 500.0 cc.), and that he secured good results both from the standpoint of clearing up the infection and facilitating healing, finding that in acute infections where there is massive edema of the tissues, a preliminary shrinkage with ephedrine is advisable as an adjuvant to the vasoconstrictive property of Sulfallantoin and that where instillation of Sulfallantoin into the sinuses was attempted, he applied cocaine first, both for its anesthetic effect and to get the maximum opening of the sinus ostia. Dr. Stovin adduces ten case reports and in his conclusion states that Sulfallantoin has proved its worth in all types of sinusitis of infectious origin and that because of the ease with which it can be introduced into the nasal cavity and sinuses, it should be given a trial before more radical therapeutic procedures are undertaken.

UPJOHN PERSONNEL PROMOTION

Physicians in this area will be interested in the progress of Feron E. Fox of the Upjohn Company, Kalamazoo, Mich. He started work in 1930 as a salesman in the Billings, Montana territory and traveled out of the company's Kansas City branch for ten years, becoming sales manager for government accounts in 1942, two years after moving to the home office. He was appointed sales manager for the company's Minneapolis branch the first of the year and on March 1 came back to this region.

BURROUGHS WELLCOME'S "BOROFAX"

"Borofax" Borated Ointment, widely used in the prevention of diaper rash, is being presented to the public in *Parents' Magazine*, *Hygeia* and *Congratulations* as a soothing emollient to help prevent and relieve baby's skin irritations, thereby enabling busy mothers to maintain a smooth household routine. Available to pharmacies is a great variety of dealer helps including folders and leaflets. These may be secured by druggists or physicians through the company's wholesalers, members of its representative staff or from the home office in New York City.

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PENICILLIN TABLET DEVELOPED FOR ORAL DOSAGE

It was announced recently by American Home Products Corporation that Wyeth Incorporated, a wholly-owned subsidiary, whose main laboratories are in Philadelphia and vicinity, had placed all of its warehouses in key centers of the country in readiness for national distribution of penicillin for civilian use on the lifting of WPB restrictions, March 15.

The Wyeth laboratories, since the early years of the war, have been a major producer of penicillin, supplying large quantities of the wonder drug to the armed forces in all parts of the world, and developing processes for production and stabilization which will greatly enhance the drug's civilian use.

Chief of these innovations, a new container called the "Vipule," combines the features of the vial and ampule. The "Vipule" has been developed by the laboratories to guard the potency of the penicillin so that it will remain stable for long periods of time. The "Vipule" method of packing furnishes a sterile product that yields a laboratory-fresh solution of penicillin at time of use under all conditions. One "Vipule" contains 100,000 Oxford units of penicillin, a second "Vipule" a sterile salt solution. An ingenious method of transferring the salt solution to the dry, porous penicillin insures the preparation of a sterile penicillin solution without exposure. This is not possible when a syringe is used in the ordinary way.

Wyeth will be ready for national distribution with the first oral penicillin tablet when the allocation of penicillin for oral use is released by WPB shortly.

SHARP & DOHME CELEBRATES 100TH ANNIVERSARY OF FOUNDING

In 1842 a young Quaker, Alpheus Phineas Sharp, was the first graduate of the Maryland college of pharmacy. Three years later he opened a drug store in Baltimore which was destined to become the pharmaceutical and biological laboratories of Sharp & Dohme of today, a leading industry of Philadelphia, Pennsylvania.

In 1852 a boy of fifteen came to druggist Sharp and asked for a position as apprentice. The boy was Louis Dohme. It was the beginning of a lasting friendship and firm business relationship. Dohme, too, attended the Maryland college of pharmacy and in 1860, three years after graduation, the firm name was changed to Sharp & Dohme. Meanwhile Charles Dohme, younger brother of Lewis, followed suit, joining the company in 1862. His son, Dr. Alfred R. L. Dohme, later became head of the company and is still a director. Dr. Dohme became a member of the revision committee of the U. S. Pharmacopoeia and remained on it for thirty years.

Both senior Dohmes became presidents of their alma mater. Charles Dohme and his son were presidents of the Maryland pharmaceutical and American pharmaceutical associations. Louis Dohme was member of the U.S.P. revision committee, Charles chairman of its board of trustees.

The history of Mulford Biological Laboratories is intertwined with that of the Sharp & Dohme enterprise, the H. K. Mulford Company having its origin in one of Philadelphia's oldest drug stores which operated on the same site for about 125 years. The Mulford Laboratories in 1894 produced diphtheria antitoxin, the first domestic product offered commercially in this country. This means of treatment was epoch making, pioneering the way to the development and use of biological products generally. In 1898 the company began the production of smallpox vaccine. In the fall of 1929 the businesses of Sharp & Dohme and Mulford Biological Laboratories were combined.

During the period since amalgamation the company has registered its greatest growth, more than doubling its size and scope and has been so closely identified with the health of the nation in the century now completed that its activities have been characterized as "a century in the conservation of human life."

NOT CANCELED

The art contest sponsored by Mead Johnson & Company on the subject of "Courage and Devotion Beyond the Call of Duty" (on the part of physicians) has not been canceled or postponed. The closing date remains May 27, 1946.

There will be no annual exhibit *this year* of the American Physicians Art Association, due to the cancellation of the American Medical Association meeting which had been scheduled to take place in Philadelphia, June 18-22, 1945.

For full details regarding the \$34,000 prizes and the "Courage and Devotion" contest, write Dr. Francis H. Redewill, Secretary, A. P. A. Assn., Flood Bldg., San Francisco, Calif., or Mead Johnson & Co., Evansville, Ind.

SOAP STILL CLEANS

We have a microscope which is getting along in years, but it is still a good microscope, says the *Rocky Mountain Medical Journal*.

Four years ago a defect appeared which gradually got worse, and gave us a lot of trouble. We eventually determined that the imperfections were confined to the top lens of the eyepiece. During a period of over three years, we tried to clean the lens with every chemical in the laboratory, short of concentrated acids. But it just got worse and worse.

We called several optical companies to see if they could polish the lens, but we were informed that it would be necessary to send the instrument back to the factory. They thought we might get it back in six months, or perhaps a year.

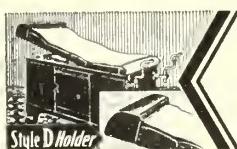
The other day we decided to wash the lens with soap and water. This wasn't as "scientific" as the other things we had thought of. We put the eyepiece together again, and looked at a smear through it. It was as clear as it had been the first time we used it, 23 years ago.

It seems that there ought to be a moral of some sort in this little story.

Maybe it is that sometimes we get too "scientific" at the expense of just plain horse sense.

Perhaps it is that life itself need not be as complicated as we humans, with our vaunted intelligence, insist on making it.

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ASK YOUR SUPPLY HOUSE



The JOURNAL LANCET

Minneapolis, Minnesota
May, 1945

Vol. LXV, No. 5
New Series

Some Problems in Fat Metabolism in Children*

Arild E. Hansen, M.D., Ph.D.
Galveston, Texas

IT is a distinct honor to be invited to inaugurate the series of annual lectures which has been made possible by a grant to the Northwestern Pediatric Society from Mead Johnson and Company. This is a special privilege for me for two reasons: first, because of my long and pleasant association with your Society, and second, because some years ago, through the efforts of Dr. McQuarrie, financial support for our research studies in the field of lipid metabolism, which is the subject of this evening's paper, was obtained from the same source.

Perhaps one of the least understood phases of medicine is that which pertains to the metabolism of fatty substances. As physicians we recognize that we are poorly informed concerning diseases involving disturbances in lipid metabolism. The physiologist, biochemist, nutritionist, and pathologist, likewise, have difficulty in understanding both the normal and the abnormal metabolism of fat. In fact, it may be stated that in all likelihood, extensive fundamental scientific and clinical studies will have to be carried out before this complex problem can be clarified. No attempt will be made to review the entire subject of fat metabolism in children, nor to discuss or even to mention all of the diseases in which a disturbance of this process exists. Instead, this discussion will be confined to studies of certain phases of the problem in which the author has had the opportunity to participate during the past few years.

Fats or lipids are characterized as a group by their physical property of being soluble in various organic solvents such as acetone, chloroform, ethyl ether, alcohol,

and petroleum ether, yet chemically and physiologically the various lipids have relatively little in common. For orientation, a slightly modified Bloor's classification of lipids is presented.

Simple lipids: These are esters of fatty acids with various alcohols.

1. Triglyceride fats—esters of fatty acids with glycerol. These are the most abundant lipids in the body as well as in foods and are of nutritional importance even though synthesized by the body.
2. Waxes—esters of fatty acids with alcohols (not glycerol). Cholesterol esters in blood and some body tissues. Significance in nutrition not known; probably synthesized by the body.

Compound lipids: These are compounds containing nitrogen bases, phosphoric acid, sugar, sulfuric acid, or amino groups together with fatty acids and alcohols.

1. Phospholipids—These contain phosphoric acid, nitrogen base and fatty acid. Lecithin, cephalin, and sphingomyelin—probably synthesized by the body; found in all cell protoplasm, liver, kidney, and brain.
2. Glycolipids—These contain carbohydrate, fatty acid, and nitrogen base. Cerebrosides—found mostly in brain and nerve tissue; probably synthesized by the body.
3. Sulfalipids and aminolipids—These contain sulfuric acid or amino acids. An ill-defined group of which little is known.

Derived lipids: These are substances derived from the preceding groups by hydrolysis.

1. Alcohols

*From the Department of Pediatrics, University of Texas School of Medicine, Galveston. The first annual Mead-Johnson Lecture in Pediatrics, presented at the meeting of the Northwestern Pediatric Society, September 29, 1944.

- a) Glycerol—oxidized in body by mechanisms similar to that in oxidation of glucose.
- b) Cholesterol—most abundant animal sterol; synthesized by the body.
- c) Phytosterols—abundant in plants, not utilized by animal organism, except ergosterol, when irradiated.
- 2. Bases—These are choline, aminoethyl alcohol, and sphingosine. Of these, choline appears to have nutritional significance and is considered to be one of the components of the vitamin B complex.
- 3. Hydrocarbons—such as squalene found in sharks. Their significance in human nutrition is not known.
- 4. Fatty acids—substances containing 4 to 24 carbon atoms in chain. Derived mostly from triglycerides, but also from phospholipids and esters of cholesterol. This is the state in which fat is oxidized in the body.
 - a) Saturated fatty acids—even number of carbon atoms in straight chain. The most abundant are those with 16 and 18 carbon atoms. They are derived chiefly from triglycerides; also synthesized by the body.
 - b) Unsaturated fatty acids
 - 1) One double bond fatty acids, of which oleic acid is the most common. They are synthesized by the body and also derived from food.
 - 2) Highly unsaturated fatty acids.
 - a) Complex, high-molecular-weight unsaturated fatty acids found especially in fish liver oils; their nutritional significance is not known and their metabolism not understood.
 - b) Essential fatty acids. These are linoleic acid, 18-carbon-atom fatty acid with 2 double bonds; and arachidonic acid, 20-carbon-atom fatty acid with 4 double bonds in chain.

Those lipids which are of especial concern to us in medicine are the triglyceride fats (often referred to as neutral fat), phospholipids (lecithin and sphingomyelin), cerebrosides (kerasin), cholesterol, and possibly certain of the fatty acids.

Fat is most commonly supplied in the diet and is most abundantly present in the body in the form of the triglycerides. These fats may be readily synthesized. The compound lipids, phospholipids and cerebrosides, are apparently also synthesized by the body and thus are not dietary essentials. The most abundant sterol in the body is cholesterol, which is readily synthesized by humans in contradistinction to those sterols which possess vitamin D activity and for which we must rely upon dietary sources or ultraviolet radiation for normal development. Of the derived lipids, choline, a constituent of lecithin, has been shown from animal nutrition to be a dietary essential. It is sometimes classed as one of the components of the vitamin B complex. The fatty acids, which are derived from triglyceride fats, phospholipids, and cholesterol esters, may be saturated or unsaturated. While chains of from 4 to 24 carbon atoms may be found in these

acids, the most common saturated ones, palmitic and stearic, contain 16 and 18 carbon atoms, respectively, and furnish the chief source of fat calories. The degree of unsaturation of a fat is measured by the amount of iodine absorbed at the double bonds in the carbon chain. The higher the iodine number, the greater is the degree of unsaturation of the fatty acid. Thus we find that oleic and linoleic acids, both containing 18-carbon-atoms, the former with one double bond and the latter with two, have iodine numbers of 90 and 180, respectively; whereas one of the highly unsaturated fatty acids, arachidonic acid, contains 20 carbon atoms with four double bonds and has an iodine number of 324. The unsaturated fatty acids appear to have special significance in this problem of fat metabolism as the animal organism, although apparently able to synthesize fatty acids with one double bond, is not able to synthesize those with two or more unsaturated linkages. This inability, together with the possible need of the body for certain of these fatty acids with more than one double bond has given rise to the expression of "essential fatty acids." The essential nature of linoleic and arachidonic acids in animals was first demonstrated by Dr. George O. Burr of the University of Minnesota.

The problems of fat metabolism run the entire gamut from the significance of the character and amount of dietary fat to the complex changes which may develop in individual body cells. In this presentation of certain studies in which the author has participated, the specific problems to be discussed involve: 1) fat absorption, 2) the serum lipids, 3) tissue lipids, and 4) the unsaturated fatty acids.

ABSORPTION OF FATS

Very little change in fat takes place in the stomach other than the actoin of acid on the lipid-protein complex which frees some fatty acids. After the fat leaves the stomach these fatty acids together with the alkaline reaction in the duodenum, the bile salts present, and the motility of the intestines effect the emulsification of the remainder of the fat, which allows the fat splitting enzymes from the succus entericus and pancreas to act upon it. Although the bile plays a very important role in the mechanism of fat absorption, the fact that this process can take place in its absence, was demonstrated by a study of the serum lipids in two infants with congenital atresia of the bile ducts. These infants were about 3 months old and were followed for a period of approximately 5 months. Four hours after ingestion of a fatty meal consisting of 35 per cent cream, the total fatty acids per 100 cc. of serum showed an increase of 143 mg. for one infant (B.G.) and 74 mg. for the other (D.H.). In both infants at the end of the four-hour period, there was a decrease in the iodine number of the serum fatty acids in keeping with the low degree of unsaturation of the fat given. This study indicated that these infants were able to absorb fat in spite of the absence of bile from the intestinal tract, although the actual increase in blood fat was not as great as that observed in the few normal infants of this age whom we had had the opportunity to study. The fasting fatty acid level in these two patients, however, was much higher

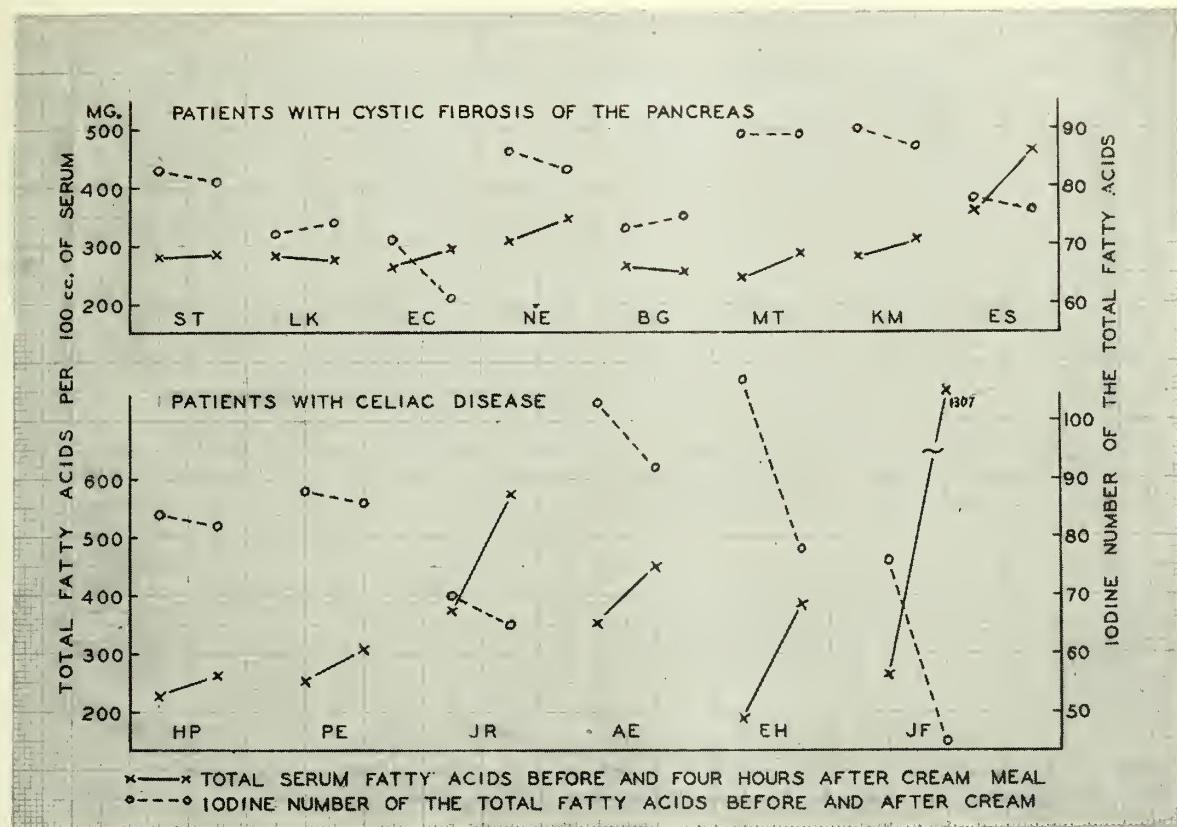


Fig. 1. Results of fat absorption studies in fourteen children with symptoms of the celiac syndrome.

(846 and 803 mg. per 100 cc. serum, respectively) than that found normally. In obstructive jaundice in adults, as shown by Epstein and Greenspan (Arch. Int. Med., 58:860, 1936), cholesterolemia commonly occurs. Thus the finding of a value of 370 mg. total cholesterol in one of our patients (D.H.) was not surprising. The cholesterol ester value in this patient, however, was not increased; in fact, this was but 27 per cent of the total cholesterol. Undoubtedly the low relative cholesterol ester value may have resulted from a biliary cirrhosis, as it is well known that the relative cholesterol ester values are decreased in the presence of liver damage. In this patient, therefore, the elevated total fatty acid level was not due to high cholesterol ester values. Fractionation of the blood lipids in both patients disclosed an excessive amount of phospholipid fatty acid. These values ranged from 355 to 462 mg. per 100 cc. in contrast with a normal average of about 120. Likewise, these fatty acids were found to comprise from 42 to 58 per cent of the total fatty acids; whereas in normal individuals studied in our laboratory, they were found to be about 30 per cent of the total fatty acids. Since the triglyceride fatty acids were only slightly increased and since in the one patient in which the cholesterol ester values were determined, these were in the range of normal, it appears that a disturbance in the phospholipid metabolism was most likely responsible for the lipemia present. We have seen no reference in the literature to the finding of an increase, either absolute or relative, in the phospholipid

fatty acids in congenital atresia of the bile ducts. Whether the abnormality present in our two cases was due to the absence of bile *per se* from the intestinal tract or to disease of the liver is yet to be determined.

The exact mechanism by which fat passes through the intestinal membranes has not been worked out, but it is quite generally accepted that this takes place by the phosphorylation and dephosphorylation of the fatty acids in the intestinal mucosa. The pediatrician is becoming increasingly interested in this mechanism as the importance of cystic fibrosis of the pancreas, a disease entity in which it is involved, becomes more apparent to him. In this disorder, excess quantities of fat in the stool are characteristically found when these patients are subsisting on a normal diet. That this is not due primarily to a lack of pancreatic lipase is apparent from fecal fat analyses, which show that a considerable portion of the fat present has been split into fatty acids and soap, presumably by the lipase of the succus entericus. Special study of fat absorption in patients with the celiac syndrome was undertaken in the Lipid Research Laboratory of the Department of Pediatrics at the University of Minnesota by Dr. Luigi Luzzatti and the author. In fourteen infants and children, in each of whom the diagnosis of celiac syndrome had been made, the fatty acids in the various fractions of the serum lipids were determined before and four hours following a cream meal. Eight of these patients appeared to have cystic fibrosis of the pancreas, and the remaining six presumably had celiac dis-

ease. Of those with cystic fibrosis of the pancreas, the diagnosis was proved in four by necropsy findings and in four by clinical and laboratory data which included the response in the duodenal juice to secretin administration. The data for the determinations of total serum fatty acids and iodine numbers in these children are graphically presented in figure 1. As will be noted the level of the total fatty acids in all these patients was within normal range. Seven of them, however, had little or no increase in the total blood fatty acids after the fat meal, and although the eighth showed a definite rise, she was proved upon autopsy to have cystic fibrosis of the pancreas. As regards the remaining six children with celiac disease shown in the lower half of figure 1, the character of the response of the serum lipids to the fatty meal appeared to reflect the subsequent course of the disease. In the two patients (N. P., P. E.) who remained in only fair condition, very little rise in the blood fatty acids occurred, whereas in the other four who showed marked clinical improvement, the rise in serum fatty acid level was considerable. The iodine number changes confirmed the findings regarding the behavior of the total fatty acids: if no fat increase in the blood was found after the cream meal, no particular change occurred in the degree of unsaturation of the fat; but if the blood fat was increased, the iodine number changed according to the kind of fat ingested by the infant.

Our findings suggest that study of the serum fats before and following ingestion of a fatty meal is of some prognostic significance. In these studies of the blood lipids in patients with celiac syndrome by Luzzatti and the author, the serum fat was fractionated into the acetone insoluble (phospholipid) fatty acids and the acetone soluble (triglyceride plus cholesterol ester) fatty acids. The level of the total fatty acids and the fatty acids in the various fractions was not abnormal, showing that, although these patients physiologically were maintained under conditions similar to those which would be produced by a diet very low in fat, the body was able to synthesize sufficient fat to keep all these fat levels within normal range. The iodine numbers of the fatty acids, however, were uniformly below normal in all fractions, and this fact suggested, as we have postulated before, that the human body is not able to synthesize the highly unsaturated fatty acids. Throughout all of these studies, it was found that the iodine numbers of the total fatty acids and the fatty acid fractions gave valuable information regarding the condition of the patient. This was particularly apparent in one eight-year-old girl (A. E.), in whom these values definitely reflected the clinical course of the patient. On first examination, the rise in total fatty acids after the ingestion of a cream meal was well within normal limits, and the child enjoyed very favorable progress. Ten weeks later when the fat absorption curve was repeated, no rise in blood fat occurred, and during the ensuing interval, this patient suffered a relapse with decrease in weight, anorexia, and lassitude. At the time the patient was doing well, the degree of unsaturation of the serum fatty acids was within normal limits; but ten weeks later, before any clinical evidence of the decline was manifest, a definite decrease in the iodine number

was noted. One month later, the iodine value had fallen to a still lower level. At the time this patient was doing well, crude liver extract plus vitamin B complex, parenterally, were being used. It may be that further and more complete lipid metabolism studies carried out in patients with celiac disease who appear to be benefited by such therapy might give some lead to a better understanding of the disease and to the entire mechanism of fat absorption.

It is well established that after leaving the intestinal mucosa, digested fat enters the lymph spaces, goes through the lymph channels to enter the cisterna chyli, passes on through to the thoracic duct, and empties into the venous circulation. However, it is still controversial whether or not some of the fat may be absorbed directly into the blood stream in a manner comparable to the absorption of simple sugars and amino acids. An unusual opportunity was afforded us to study this problem when a three-week-old infant with chylous ascites was admitted to our hospital. On two occasions the serum lipids of this patient were studied before and after administration of 4 ounces of 35 per cent cream. In neither instance was there a change in the amount or the degree of unsaturation of the total fatty acids or those in any of the lipid fractions. In addition to indicating that lymph channel obstruction was complete in this child, the findings strongly suggested that no fat was absorbed directly into the blood stream. This past fall an attempt was made to transfer a blood vessel from the thigh into the peritoneal cavity to correct this condition, but the child unfortunately died from the anesthetic while the procedure was being carried out. At the time of death, the child had been under our care since birth, a total of 23 months, during which time he had been maintained on a diet practically devoid of fat. From our observations, we can state that life apparently can be maintained for the first two years even though no fat is included in the diet. Growth and development in this child were fairly satisfactory, but he never did have the appearance of a robust, healthy individual. He was unusually susceptible to respiratory infections and had considerably more difficulty with skin conditions than the ordinary child. A more detailed report of our serum and tissue lipid findings in this patient will be made later when these studies are completed.

BLOOD LIPIDS

Numerous studies of the blood lipids have been undertaken to learn something of the mechanisms of fat transport and mobilization as well as the derangements of these in disease conditions. Although several such studies have been made in our laboratories, attention here will be given only to one, in which instance we had the opportunity to study the type of lipemia commonly associated with nephrosis. In this latter condition the blood fats may rise to very high levels, and the value for the total fatty acids, phospholipid, cholesterol, and cholesterol esters are all increased. It is often stated that the increase in blood fat in this condition may be a compensation for the decreased osmotic pressure caused by the low plasma proteins, but this concept has not been proved. We had the opportunity to make a rather complete serum lipid

analysis in an infant who was suffering from a marked hypoproteinemic edema which developed in a case of cystic fibrosis of the pancreas due to poor absorption of protein. The plasma protein levels in this patient were: total proteins 3.39, albumin 1.98, globulin 1.41 grams per 100 cc. As shown in our series of cases with fibrosis of the pancreas discussed above, although unable to absorb fats normally, patients with this condition are able to synthesize them. Therefore, were the lipemia which develops in nephrosis on a simple compensatory basis, with the low plasma protein levels found in this patient, we should have expected to find a considerable rise in the serum fatty acids. However, these remained within normal range, values being as follows: total fatty acid 253, acetone soluble fatty acids 163, acetone insoluble fatty acids 75, total cholesterol 98, and cholesterol ester 50 mg. per 100 cc. Further evidence that the amount of fat available to the body, as influenced either by the dietary intake or absorption of the fat, does not affect the high blood fat levels as seen in nephrosis was indicated by our failure in one acute experiment in a patient with nephrosis to reduce the lipemia present by keeping the child on a diet very low in fat. From these studies it would appear that some explanation other than a simple compensatory reaction probably accounts for the increased mobilization of fat in the vascular system in nephrosis.

TISSUE LIPIDS

In connection with the complex changes which may occur in the lipid composition of tissues under various conditions, we wish to cite results of tissue lipid analyses in but one type of disorder. The patient involved was one suffering from a generalized lipodystrophy (lipohistiodiuresis), who, because of almost complete loss of fatty tissue from the body, presented a most bizarre picture. Studies of this patient were carried on in cooperation with Dr. Irvine McQuarrie and Dr. M. R. Ziegler. On histologic examination, no fat cells could be identified. In fact, it was impossible to find any subcutaneous fatty tissue for lipid study, and analysis of perirenal tissue gave findings as low as 0.45 grams of fat per 100 grams of fresh tissue. Normal values for the fat content of subcutaneous tissue as determined in two control subjects were found to be 50.1 and 84.0 gm. per 100 cc. of fresh tissue. Even in a child with lypodystrophia progressiva, lipid analyses of subcutaneous tissue obtained by biopsy revealed the fat content of the tissue to be 4.79 grams per 100 grams of wet tissue as contrasted with an absolute lack in our patient with the generalized lipodystrophy. To date a satisfactory explanation of the specific loss of fat from subcutaneous tissues has not been forthcoming, although attempts have been made to relate this to endocrine, nervous, and tissue enzyme abnormalities.

ESSENTIAL FATTY ACIDS

The last subject to be discussed in this consideration of some of the problems of fat metabolism is that of the so-called essential fatty acids. Although it is generally accepted that the highly unsaturated fatty acids, linoleic and arachidonic, are essential for normal nutrition of certain species of animals, their exact physiologic role is not known, nor has their essentiality in humans been definitely established. As pointed out by Burr and Burr

in 1929, rats reared on diets extremely low in fat failed to grow normally, developed skin changes, hematuria, and died early. Because of a grant made by the National Live Stock and Meat Board we have been able to study the problem of the unsaturated fatty acids in human nutrition and in the dog as the experimental animal. The author and Dr. Hilda F. Wiese found that puppies fed on low fat diets developed a marked flaky desquamation and dryness of the skin with coarseness of the hair as the most distinct abnormalities. The hair and skin of litter mate control animals given the same diet except for the isocaloric substitution of fresh lard for sucrose remained entirely normal. Serum lipid studies in these animals revealed that the fatty acid levels in the various serum fractions remained within normal limits even though no fat was in the diet. This finding signified that these animals synthesized sufficient fat to maintain normal levels in the blood serum. Determination of the iodine numbers of the fatty acids in the various fractions, however, indicated that highly unsaturated fatty acids were not synthesized by these animals. The fatty acids present as esters of cholesterol showed the greatest difference in the degree of unsaturation in these groups.

Our studies on this phase of fat metabolism in human subjects are comprised of: 1) observation of the child with chylous ascites referred to above over almost a two-year period and of an adult maintained six months on a diet extremely low in fat; 2) study of the serum lipids in eczematous patients and the use of lard and other fats rich in unsaturated fatty acids as dietary supplements in these patients. From our observations of the child with chylous ascites and the adult mentioned above, granting that these so-called essential fatty acids cannot be synthesized, it would appear that the human subject can be maintained fairly satisfactorily without them, at least for the periods of time which these individuals were under our observation. While the adult subject suffered no untoward effects whatever, it should be noted that the child with the chylous ascites, as mentioned previously, did have more difficulty than the average child with respiratory and skin conditions and did not have the appearance at any time of a healthy, robust individual. On the other hand, from studies of the serum lipids in eczematous patients, the author and co-workers have obtained indirect evidence that these unsaturated fatty acids probably do play some definite role in human nutrition. The majority of infants and children suffering from intractable eczema which were studied were found to have abnormally low iodine numbers for the serum fatty acids, indicating decreased amount of unsaturated fatty acids in their blood sera. In pooled lipid extracts of serum from patients with eczema and from control subjects, Dr. William R. Brown and the author actually found lesser amounts of the unsaturated linoleic and arachidonic acids, in the serum of the eczema patients. Clinical evidence that these unsaturated fatty acids may be of significance in the maintenance of normal skin functions has been obtained from adding fats such as fresh lard and certain vegetable oils to the diet of these patients suffering from severe eczema. Although not all of them responded to this dietary supplement, about one-half of the patients with persistent eczema were definitely improved when one tablespoon of lard two or three times daily was taken for periods of two or more months. The data concerning the blood lipid and clinical studies in these patients with eczema are now being analyzed for the purpose of publication.

In conclusion, we may state that much work must be carried on both in experimental animal and in human subjects before these and other problems in lipid metabolism may be solved. Only by continued cooperative study of the chemical, biologic, and clinical aspects through scientific investigations by physicians, biochemists, and other fundamental scientists will we be able to better understand and hence better deal with the disturbances in fat metabolism which are constantly being encountered in the practice of pediatrics.

Conversion Hysteria in Children*

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FAILURE to appreciate the fact that conversion hysteria occurs in children as well as adults is frequently responsible for its being entirely neglected in differential diagnosis. Consequently, treatment of children so afflicted is disappointing to all concerned. Furthermore, when these patients eventually come under the care of a psychiatrist or a psychiatrically oriented pediatrician, the task of rehabilitation is immeasurably complicated.

A survey of the literature¹ from 1930 to 1944 reveals but sixteen titles dealing with the subject of hysteria in children. While reports^{2,3} indicate conversion hysteria is commonly encountered among the armed forces in combat, Despert⁴ and Gillespie⁵ fail to mention it as a significant problem in children subjected to war conditions. The sparsity of references to the subject in the recent literature stands out in sharp contrast to the keen interest manifested during the period from 1873 to 1915.

The experience of the department of pediatrics of the University of Minnesota suggests that conversion hysteria in children is more common than ordinarily suspected and deserves more attention than it has received during the past few decades.

The basis of the present report is a study of sixteen children having a final diagnosis of conversion hysteria. Their ages varied between six and fifteen years. Thirteen were females; three were males. The majority were in the pubertal age group. These findings are consistent with those reported during the years when interest in the subject was at its height. Psychological testing revealed three patients had superior intelligence with the others all earning a rating within the normal range.

Eleven of the patients were hospitalized from one and one-half to sixteen weeks, the average stay being seven weeks. Five patients were placed in a boarding home which permitted frequent visits to the outpatient clinic. The average length of time for those treated on an outpatient basis was four weeks.

PRESENTING COMPLAINTS

The presenting complaints at the time of admission are outlined in table 1.

TABLE 1
Complaint

- Patient 1—Blurred vision, dizziness, slowing of speech and general activity.
- Patient 2—Pain in left face, chest, colicky pain in left flank and thigh, inability to move jaws, frequent and painful urination.
- Patient 3—Pain in joints and stomach, poor vision, inconstant tingling and prickling of the skin.
- Patient 4—Palsy of left arm and leg.
- Patient 5—Fainting spells and dizziness.
- Patient 6—Palsy of head and extremities, refusal of food and retention of urine.
- Patient 7—Spells of unconsciousness, vomiting, headache, pain in neck, delirium.
- Patient 8—Blindness in left eye, fainting spells.
- Patient 9—Paralysis and pain of hands and feet.

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Patient 10—Nervousness, sleeplessness, constipation, urinary frequency, disturbances of sensation and spastic contractures of extremities.

Patient 11—Unconscious spells occasionally preceded by disturbances in smell and hearing, seeing double, gas pains in stomach, and shaking of extremities.

Patient 12—Pain in joints, heart and stomach, left hemiplegia, unable to open eyes or jaws.

Patient 13—Partial loss of vision.

Patient 14—Unconscious spells, weakness, right frontal headache, paralysis of right side.

Patient 15—Contracture of right hand, headache, nervous chills and weakness.

Patient 16—Blindness.

Contrary to popular belief, these patients presented multiple complaints. As will be noted, several offered symptoms of organic illness. The symptoms of Patient No. 2 suggested renal colic. Careful search into the past history revealed that her grandmother, of whom she was very fond, had been treated previously for a kidney stone. The father of Patient No. 4 had a left-sided palsy following a cerebral accident.

By far the greater number of the complaints were referable to disturbances in the central nervous system. Six patients complained of disturbances in vision, one being totally blind. Two had total blindness in one eye. Complaints referable to the gastro-intestinal tract, bones and joints, urinary tract, and cardiovascular systems were far fewer than might have been expected.

Careful and repeated physical examinations revealed no suggestive or conclusive explanation for the presenting complaints, except to substantiate their existence. Five of the children with visual disorders had definitely constricted fields as reported by the staff of the department of ophthalmology. One was completely blind.

Neurological examinations were essentially negative in every case except in Patient No. 6 who presented hypoactive reflexes and bilateral unsustained ankle clonus.

Laboratory data were likewise essentially negative, except for Patient No. 6 who presented evidence of a mild acidosis, probably due to a prolonged self-imposed fast. An average of six laboratory examinations, including urinalysis, blood counts, serology, sedimentation rates, special blood chemistry studies, and x-rays, was done on each patient.

The duration of symptoms from the time of onset until admission to hospital varied from four hours to thirty-six months. The majority of the patients were ill from one to five months prior to the time of their referral. It is disconcerting to note that the average duration of symptoms was eight months. This fact in itself clearly indicates that the importance of psychogenic disturbances in childhood is not yet fully appreciated by many physicians. This is highly significant as therapy becomes increasingly difficult when the underlying etiological factors are allowed to go unrecognized for so long a time.

REFERRING DIAGNOSIS

The diagnoses suggested by the referring physicians are outlined in table 2.

TABLE 2

Patient 1	—Defective vision.
Patient 2	—Kidney stone, ?? tetanus, ??? hysteria.
Patient 3	—Rheumatic fever, ?partial bowel obstruction.
Patient 4	—Cerebral pathology.
Patient 5	—Petit mal and unconsciousness.
Patient 6	—Dementia praecox.
Patient 7	—Hysteria
Patient 8	—Blindness and petit mal.
Patient 9	—Multiple neuritis.
Patient 10	—Hysteria.
Patient 11	—Hypotension, epilepsy.
Patient 12	—Neuritis, heart trouble.
Patient 13	—Hysteria.
Patient 14	—Neurosis.
Patient 15	—Hysteria.
Patient 16	—Retrobulbar neuritis.

Analysis of the referring diagnoses revealed that hysteria was recognized in but 4 of the 16 patients. As noted, it was offered as the last of three diagnostic possibilities in the case of Patient 2. The referring physician's diagnosis of hysteria was substantiated in these 5 patients. In 5 additional cases the diagnosis was made upon admission to hospital. Of the remaining 6, hysteria was diagnosed only after several days of critical observation. The diagnosis of conversion hysteria in children is not always easy to make with certainty.

PREVIOUS MANAGEMENT

Therapeutic measures previously employed in some of the patients are briefly summarized to emphasize their ineffectiveness:

Patient 3—Two previous hospitalizations. During the first of these an appendectomy was performed, and during the second a vermifuge, salicylates, and sulfanilamides were given without benefit.

Patient 5—Sedation for one month resulted in no improvement.

Patient 6—Eight electric shock treatments administered during two weeks' hospitalization produced only temporary improvement.

Patient 7—Chloroform given to control convulsive-like seizures; also chloral hydrate and morphine. Three diagnostic pneumoencephalograms revealed no abnormalities.

Patient 9—Treated by several physicians. Arrived at hospital in splints.

Patient 10—Bed rest and sedatives for several months. Treated by four physicians, an osteopath, and chiropractor. One physician made a diagnosis of peripheral neuritis, and in the patient's presence told the mother, "Your daughter will never walk again."

Patient 11—Appendectomy six weeks prior to onset of convulsions. Water restriction and anti-convulsant therapy ineffective.

Patient 12—Appendectomy seven months prior to onset of symptoms. Later hospitalized for two weeks with no lasting improvement.

Patient 13—Optometrist changed glasses frequently for period of four months.

Patient 14—Varied complaints for one year prior to onset of a transitory hemiparesis. One week later an appendectomy was performed.

Patient 15—Cast and splints tried unsuccessfully by local physician. Hospitalized in an orthopedic hospital for months with only slight improvement.

Attention is called to the four patients who had an appendectomy. Careful review of their histories suggests the possibility that the abdominal complaints may have been largely hysterical in nature. If this impression is correct, four unnecessary operations were performed. One of our patients suspected of cerebral pathology had had three pneumo-encephalograms and was waiting for a fourth at the time the diagnosis of hysteria was made. Management of hysterical patients as noted above is to be deprecated. It is disappointing to the physician and to the family. Grave injustice is done to the patient. Improper management serves only to fix more firmly the emotional disturbances and mental conflicts which are basic in this disorder. Furthermore, secondary gains derived from the illness create additional problems in treatment.

The presenting complaints were sudden in onset in nine of the patients. For emphasis, the precipitating factors have been summarized as follows:

Patient 2—Patient and family feared that father who had threatened and tried to kill family would receive pardon from a correctional institution.

Patient 3—Feared favorite uncle might be drafted.

Patient 4—Father's death.

Patient 5—Became extremely angry while chasing a boy.

Patient 6—Found a neighbor dead.

Patient 7—Family broken up by court order.

Patient 8—Drunkard struck at her eye without actual contact.

Patient 9—Disliked temporary foster home and wished to return to her own.

Patient 16—Sudden blindness during an attack of the measles.

In the other 7 cases, the onset was more vague and insidious. Two patients were adopted children and unhappy; one was unhappy in a foster home. Another was jealous of a half-brother, fearing that he was the mother's favorite.

Stable home conditions are essential to the child's sense of security. An analysis of the circumstances of the homes represented in this series revealed the following findings which seem significant.

Economic circumstances were poor to marginal in all but two of them. Ill health of one or both parents was found in nine families. In four homes the father was alcoholic. To complicate the picture, parental tension was found in eight of the families. Marked sibling rivalry existed in four of them. Removal or the threat of removal of a favorite member of the family through the demands of war was significant in three cases. Divorce, step-parents, and adoption figured in several. In every case two or more of the above were found.

DIAGNOSIS

Since the symptoms of conversion hysteria are protean and may mimic practically any organic illness, the diagnosis is never conclusive until the possibility of organic disease is excluded and evidence of psychopathology substantiated.

As a detailed consideration of the differential diagnosis is impossible in this brief discussion, only a few of the more common childhood illnesses are mentioned.

1. Conversion hysteria is frequently mistaken for rheumatism, rheumatic fever, or chorea. The complaint of body aches and pains associated with nervousness and a slight temperature is often encountered in the hysterical child. An error in diagnosis means confinement to bed for a prolonged period of time—to the detriment of the patient. Such management serves only to fix more firmly the neurotic reaction and to make treatment more difficult when the diagnosis is established. One of the patients in this series had been confined to bed for several months only to recover spontaneously when treated psychotherapeutically. An hour's interview with the parents suggested the diagnosis could have been made at the onset of the illness.

2. Convulsive-like attacks in children can be and often are hysterical. Electro-encephalographic studies and the water pitressin test can be of real value in differential diagnosis.

3. Periodic acute attacks of abdominal pains and vomiting with minimal or no confirmatory physical findings and with rapid recovery should be viewed with caution.

4. The possibility of a brain tumor or other cerebral pathology cannot be ignored. Several of the patients in this series required careful neurological study to exclude central nervous system pathology. Grave injustice has

been done many children erroneously classified as hysterical when in reality they were organically ill.

The question naturally arises: how can one make the diagnosis if it is so difficult? In our experience the following procedures have been found helpful:

1. In no other condition is a complete history more essential. Thoroughness and attention to detail are required. Several items are of special importance:

a) The nature of the onset requires definition. While hysteria may develop slowly and insidiously, fully 50 per cent of the patients develop this condition following sudden severe emotional experiences. In the present series, loss of a favorite member of the family through death or induction into the armed forces, severe illness in the family, parental conflict or threatened disruption of the family were most common. It should be emphasized that while such traumatic experiences will precipitate an attack of conversion hysteria, they are not essentially the causative factor. Minor worries, conflicts, and other emotional tensions are significant in both sudden and insidious onset.

b) Investigation of the emotional atmosphere of the home is important. Parental disharmony often bears a direct relationship to the child's illness. How do the parents get along? Is the child, as well as other siblings given fair consideration in the family pattern? Are the parents (particularly the mother) too fussy, exacting, or too austere in the demands made on the child? Is the child compelled to take sides in parental disharmony?

c) The child's personality requires careful evaluation from the point of view of the history as well as direct observation. It is not uncommon to note that a child previously nervous, fidgety, fearful and anxious has suddenly become quite the opposite. As with older hysterical patients, the child assumes an attitude of utter indifference to his affliction, or at times, when carefully observed, a peculiar satisfaction in his symptoms and the attention given him. Contrary to current opinion, the child most prone to develop hysteria is the extremely sensitive, shy, modest, reserved, or serious youngster who is unable to handle everyday relationships in a healthy out-going manner.

2. The absence of conclusive physical findings should be carefully evaluated. Minimal findings may cause the attending physician to procrastinate "just in order to be sure." The attitude of the child during the examination is helpful as he frequently presents the "belle indifference" commonly encountered in conversion hysteria.

3. Direct observation of the patients during sleep is helpful. Patients suffering from paralyses, hyperesthesia, aches and pains in muscles and joints are able to move about freely while asleep. Likewise, spasticity disappears. These promptly reappear upon awakening.

Such observations are extremely helpful in making a satisfactory diagnosis which then becomes essentially an evaluation of the total situation rather than of the presenting symptom.

PSYCHOPATHOLOGY

Many theories have been advanced to explain the nature of hysteria. The one point on which all authorities agree is that it is psychogenic in origin. Charcot empha-

sized the constitutional factors, believing it to be an inherited, degenerative condition. He also pointed out the important part played by imitation. The significance of suggestion was emphasized by Babinski and Bernheim. Dejerine called attention to strong and acute emotional upheavals prone to accompany the hysterical reaction. He and Janet recognized the process of disassociation and the symbolic nature of the symptoms. Janet also pointed out the immediate advantages derived by the patient from illness. Freud and the adherents of the analytical school still maintain that the basis of hysteria is related to forgotten or repressed conflicts emanating from sexual trauma. Freud stressed the role of substitution which is often important in hysteria. White⁶ regards substitution as being "the cause of the most obvious symptoms in hysteria." He further states, "It is substitution but the substitute is a part of the individual's own body. This form of substitution is technically known as *conversion* and means that the mental difficulty has been converted by this mechanism into a physical difficulty." While none of these theories has explained the total process of the hysterical mechanisms, all have helped to clarify it.

Hysteria is essentially more than a symptom or constellation of symptoms. It is a specific reaction to difficulties accruing from the everyday adjustments required of the individual as he attempts to find satisfactions in daily living. The appearance of the hysterical symptom or symptoms is solely dependent upon the individual's emotional reactions to his own life situation. In this sense, hysteria is one pattern which the individual may adopt to solve his mental conflicts which may or may not be conscious. The reaction may occur more readily in those individuals so predisposed—it may involve imitation, suggestion, repression, or any of the other various mental mechanisms offered in the theories suggested above. Whatever the specific mechanism, when the conflict is resolved the individual is relieved and content. Thus his illness has meaning for him and assumes symbolic significance.

Strecker⁷ has suggested that 1) the basis of the hysterical reaction is in unresolved emotional conflicts which have been converted into clear-cut somatic symptoms, easily discoverable upon objective examination; 2) the hysterical symptoms are always protective in nature; 3) they represent an escape from a situation which is intolerable to the individual; and 4) various factors such as predisposition, fatigue, and emotional trauma may act in a precipitating role.

Acceptance, security, and particularly love are the fundamental needs of children and are satisfied as the child aligns (or identifies) himself with an older person or persons (usually parents) who represent to him strength, stability, and security. It is out of these that he builds for himself a sense of adequacy, security, and self-reliance. When these fundamental needs are not gratified, conflict arises which may resolve itself by the child's "falling ill." Schilder⁸ has said "the hysterical person is one who needs love." We think this is particularly true of children.

PROGNOSIS AND COURSE

All of the patients in this series recovered from their original symptoms. Twelve have made a good adjustment while the remaining four have continued to have personality difficulties following recovery from the conversion symptoms.

In general, the more dramatic the onset, the easier it is to define the precipitating situation, and the less difficult it is for the understanding physician to proceed with confidence and assurance.

The hysterical reaction which is slow and insidious in its onset is harder to deal with because the basic disturbance is often buried deep within the psychic structures of the personality and is better organized. Likewise, the child is more reluctant to relinquish the secondary gains which he has derived from his illness. One of our patients—a boy aged nine—ill for four months and confined in three hospitals prior to admission here, required a prolonged period of treatment before he suddenly and dramatically recovered. Another patient—a 13-year-old girl who had been treated in her own home for four months—proved more difficult in management than would have been expected had she been adequately handled early in her illness.

Occasionally patients with attendant disturbances in affect or mood are encountered. If the patient exhibits depressive or anxiety features during the process of treatment, the prognosis must be more guarded.

Though the hysterical symptoms clear spontaneously under proper guidance and therapy, the outlook for the patient's future mental health is not always promising. The prognosis in a patient who has suffered severe and persistent symptoms is less favorable. Often such patients are unable to enter easily or wholeheartedly into a psychotherapeutic relationship, offering many subtle resistances to one's best efforts. When this occurs, the ultimate outlook becomes even more uncertain. A bad family history needs full consideration in evaluating the ultimate course of the patient's mental health as does any tendency to be seclusive, asocial, or overconscientious. Repeated hysterical reactions are also discouraging signs.

In general, however, the child suffering from an attack of acute conversion hysteria who responds easily and favorably offers a good immediate recovery and subsequent satisfactory development. It is not necessarily true that "once hysterical, always hysterical."

TREATMENT

The only rational treatment of conversion hysteria is psychotherapy. Its success depends upon a number of factors. 1) First and foremost is the orientation of the physician. He must not only accept the psychological nature of the disorder, but must have an understanding of the fundamental etiological determinants and mechanisms. Lacking this he may attempt to treat the presenting symptoms and only reinforce the patient in his illness.

The aim of therapy is the removal of symptoms. However, it is more important to assist the patient to understand the nature and meaning of his symptoms than to attack the symptoms directly. One psychologically oriented will not make the mistake of using prizes, decept-

ion, or such cruel methods of treatment as punishing or ignoring a patient suffering from hysteria. Nor should the child be accused of malingering.

2. Unnecessary electrical treatment, massage, and physiotherapy should be discouraged, except when a real need exists. However, actual physical needs such as malnutrition should not be neglected.

3. The child should be removed from his home and placed either in a hospital or in a suitable boarding home. This reduces the opportunities for unwholesome attitudes and feeling states to become fixed. The friendly but objective attitude of understanding foster home parents or house staff and nurses makes more possible the wholesome handling of the child. Some may object to removal of the child from the home. However, our experience suggests that temporary removal is to be preferred.

4. Direct psychotherapy with the child is essential. If he is under ten years, play therapy may be helpful. In older children principles of psychotherapy ordinarily employed with adults are often fruitful. Repeated friendly discussions with the child of his feelings about himself and others, of his dreams, and of his own reactions to everyday experiences, will frequently provide sufficient release from emotional tension to permit the gradual dissipation of the symptoms. Out of these friendly talks he develops insight and understanding, and the presenting symptoms disappear. Recovery may be gradual or it may be sudden and dramatic.

5. Treatment of the family, particularly the mother, should proceed along similar lines. As soon as the diagnosis is made, the physician should give strong reassurance that recovery will take place. He should be candid, pointing out that the underlying difficulty is an emotional disturbance and that the principal aim of treatment will be to get at its source. This explanation helps the parents provide information needed for further understanding of the problem.

If it is decided, after thorough investigations have been made, that there is little or no hope of modifying the aggravating home circumstances, the child should be permanently removed from the home.

In dealing with conversion hysteria, it is well to remember that an individual, rather than an organ, is being treated; that the symptoms are essentially protective in nature; that they are purposeful; and that once understanding is developed, the patient recovers. In general, treatment should be broad and all-inclusive, directed toward the development of insight in the patient and those having an active part in influencing him.

SUMMARY

1. Attention has been called to the fact that conversion hysteria continues to exist as a medical problem in children.

2. Findings on sixteen patients varying in age from nine to fifteen years treated at the University Hospitals have been presented.

3. Psychopathology, course and prognosis, diagnosis and principles of treatment have been briefly discussed.

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Dental Arch Development as a Guide to Time for Malocclusion Correction*

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THIS study of growth and development of the dental arches of children was begun at the Institute of Child Welfare, University of Minnesota, in 1926, and has been carried on without interruption under the guidance of Dr. John E. Anderson and Dr. Richard E. Scammon. The Institute of Child Welfare has maintained an experimental nursery school and kindergarten with an enrollment of approximately fifty children ranging in age from two to six years and from all walks of life. They are evenly divided as to sex and are fairly representative of the population. After completing the course at the Institute, these youngsters returned periodically for this study.

One of the purposes of the study was to help determine, if possible, what changes take place in the dental arches incident to growth and development, and this presentation will discuss how this information may be applied in determining the most advantageous time to start treatment of malocclusion.

Annual impressions were taken of the mouths of 156 children, and a longitudinal study was made of 28 selected cases, covering an age period of $3\frac{1}{2}$ to $13\frac{1}{2}$ years. For many of these children records were obtained over a longer period of time, but it was thought that this age limit would adequately cover the period of growth during which the teeth were erupting and show the development of the arches during the transitory period from the deciduous to the permanent teeth.

The method of growth of the dental arches and the period in which it occurs has intrigued the curiosity of many investigators, and has given rise to much speculation as to factors influencing its growth and development. As a result the problem has been attacked from many angles of research. Brash, Thoma, Scott, Todd, Hellman, Bogue, Bonwell, Howley, Gilpatrick, Hyde, Goldstein, and Lewis are some of the investigators who have spent a great deal of time developing knowledge of this study.

After careful consideration of various landmarks adopted by other research workers, it was felt that the measurements taken from definite cusps were very reliable; consequently, that was the point of measurement used in this study. On Fig. 1 the various points from which the measurements were taken are shown in white ink.

Fig. 2 shows the mean growth and development of the upper arches. The heavy line represents the mean measurement of the boys, and the broken line, that of the girls. Observe, that the arch is somewhat wider between the permanent six year molars of the girls than that of the boys of the same age. Very little lateral growth ever develops in this portion of the arch. The growth curve of the boys and the girls in the cuspid-to-

cuspid area and in the area between the deciduous molars on both sides of the mouth appears to follow about the same pattern with a consistently larger arch development for the boys as compared with that of the girls. There appears to be some little growth between the first deciduous molars on either side of the arch. There is quite a definite growth in the cuspid-to-cuspid area of the upper arch. The period occurs in both boys and girls at from 6 to 8 years of age, which corresponds approximately with the time of eruption of the upper incisors. These findings agree in general with those of Lewis, except that his findings showed complete cessation of growth between 9 and $10\frac{1}{2}$ years, while our findings showed continued growth up to the twelfth year. Between the mesial surfaces of the cuspids to the distal surfaces of the second deciduous molars there appears to be no growth and, in fact, the space is shorter at $13\frac{1}{2}$ years than it was at $3\frac{1}{2}$ years.

Figure 3 shows that mean growth curve of the lower arches. Here again there seems to be a consistency in the pattern of growth curve. The boys' arches are definitely wider in the cuspid-to-cuspid area, while the arches of the girls are very definitely wider in the area between the permanent molars. Very little lateral growth occurs in the molar areas, but a constant and definite growth period appears in the cuspid-to-cuspid region between the ages of $5\frac{1}{2}$ and 8 years. Observe, that the difference between the mesial surfaces of the cuspids and the distal surfaces of the second deciduous molars constantly becomes smaller, and have diminished approximately 2 millimeters by the time the permanent bicuspids have taken their positions in the arches. It may be of interest at this point, to emphasize the different types of patterns of arches that boys and girls develop. The girls' arches are narrower in the cuspid-to-cuspid region than are the boys', but the girls' arches are wider in the posterior and first permanent molar regions. Thus, the boys' arches are more rounded, the girls' more v-shaped. These mean growth curves may frequently be helpful in determining what the normal arch should be, and in many instances they are of considerable practical value. However, there are frequent occasions in which arches develop normally along different patterns, and it would be foolhardy to attempt to accept these cases as the mean pattern of growth as developed for any particular group of children. In other words, these mean curves show a tendency; they do not determine individual variations from the normal.

The following general conclusions may be drawn from this study:

1. The greatest amount of growth in the dental arches occurs in the cuspid-to-cuspid area.
2. The greatest amount of growth in the cuspid-to-

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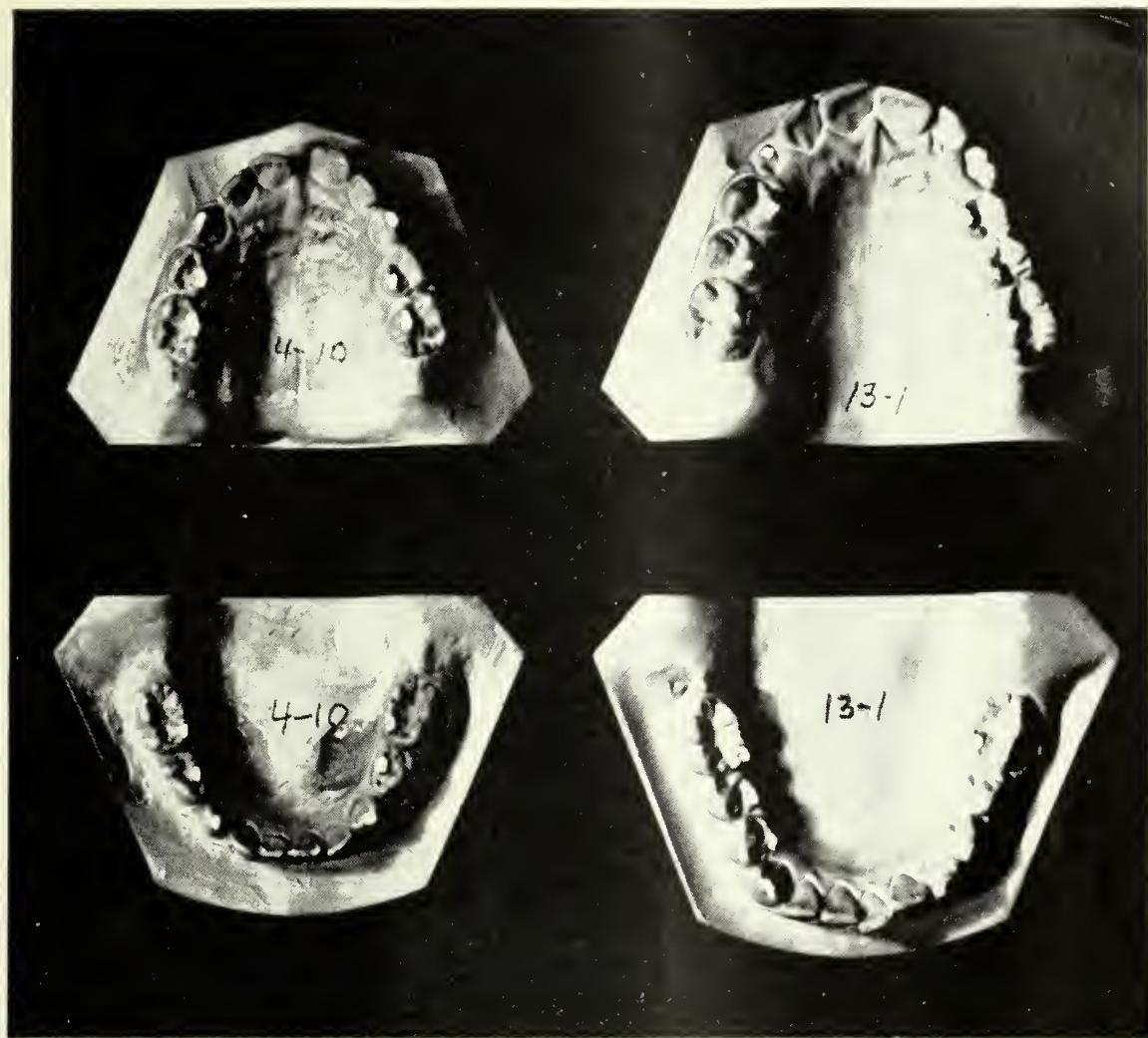


Fig. 1.

cuspid area occurs during the eruption period of the permanent incisor teeth.

3. The distance between the lower cuspids reaches its maximum width at approximately 8 years of age.

4. The distance from the mesial surfaces of the upper cuspids to the distal surfaces of the second premolars on the same side becomes somewhat shorter in the upper arch. In the lower arch there is a definite decrease in this measurement of approximately 2 mm.

5. The dental arches of girls, and particularly the lower arches, are wider in the posterior, but narrower in the anterior section than those of the boys.

The two chief reasons for instituting orthodontic procedure are for the improvement in mastication and for the improvement in asthetic appearances. Frequently, slight irregularities do not detract from a child's appearance, and if the teeth occlude well, then certainly there is no need to spend time and effort necessary to place the teeth in a slightly better position. However, when either mastication, or the pleasant personality of the child

is interfered with, as a result of malocclusion, then the condition should be corrected if possible. In general, children seem to have very little objection to wearing orthodontic appliances. When treatment is found necessary, the earlier the malocclusion can be corrected consistent with good judgment, the more successful the correction will be. The following general rules may be helpful in determining when to advise orthodontic attention:

1. Proper mastication is essential for children, and when this is difficult or impossible because the upper and lower teeth do not meet as they should, correction should be instituted at the very earliest date, possibly at three or four years of age. This would apply in the case of either an extreme overbite, where the upper teeth protrud excessively, or in the case of a prognathous jaw, where the lower teeth are more forward than the upper ones.

2. When the anterior teeth are in a crowded position, while the remaining teeth appear in good alignment, ex-

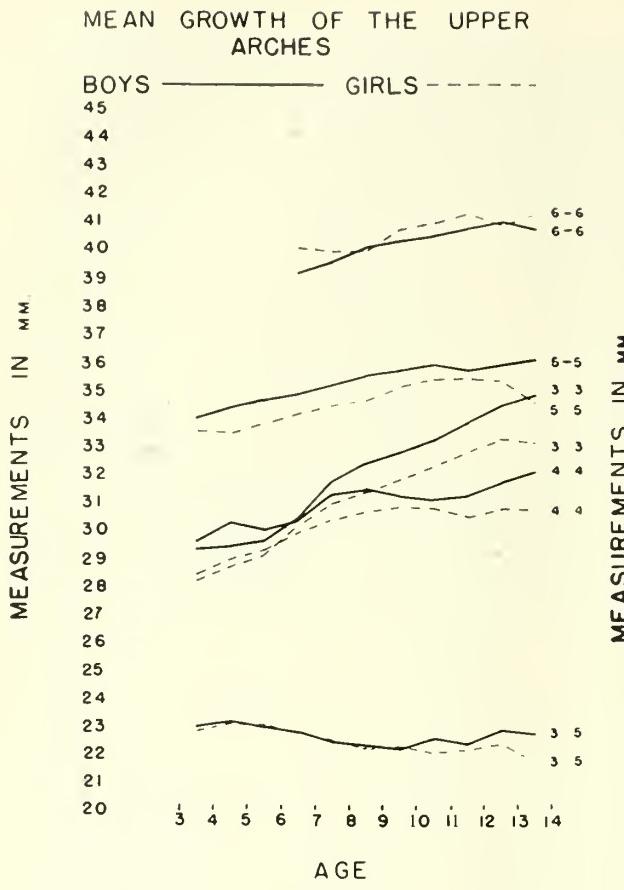


Fig. 2.

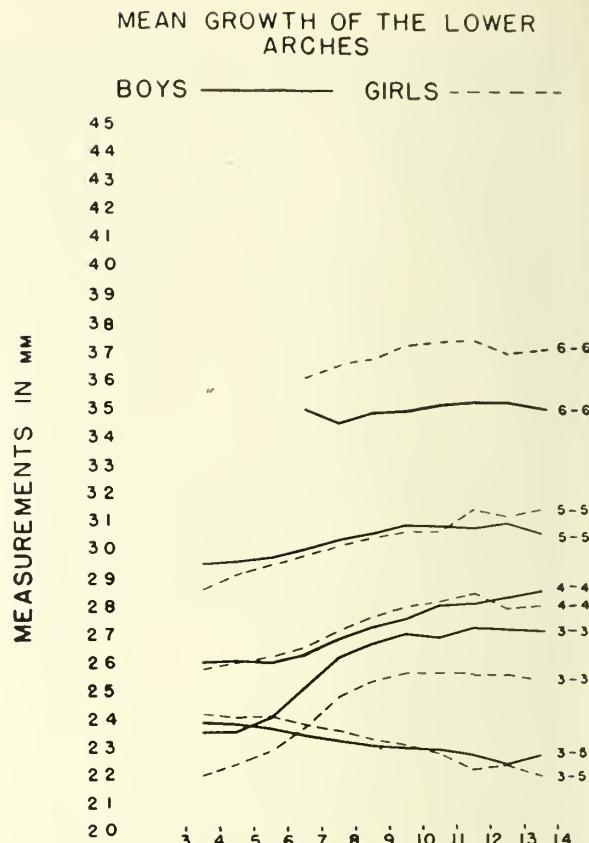


Fig. 3.

pansion of the anterior segment of the arch may be advantageously accomplished during the growing period of that portion of the arch, which usually is between the seventh and eighth year.

3. Correction of other malformations should be started by the tenth year if possible, because it has been the experience of many practitioners that, as a general rule, children often refuse to wear the necessary orthodontic appliances during their period of adolescence. Girls particularly object to wearing them during this period. Consequently the orthodontic problem can be lessened considerably if all appliances are on and off at the very earliest date or at least before the children advance very far into the adolescence period.

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The United States public health service in cooperation with the National Foundation for Infantile Paralysis is offering fellowships for graduate work in health education. For the fall of 1945 these fellowships are open to men and women between 22 and 40 who hold a bachelor degree from a recognized college and will lead to a master's degree in public health. The training will require twelve months, nine of which will be spent at a school of public health, three in field experience. The fellowship provides a stipend of \$100 a month, full tuition and travel for field experience. Application forms may be had from the surgeon general, United States public health service, Washington 14, D. C., and must be received no later than June 1, 1945.

Congenital Atresia and Congenital Tracheoesophageal Fistula*

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THOMAS GIBSON in 1696 observed a case of congenital atresia of the esophagus with a tracheo-esophageal fistula, noting the typical feeding difficulties and accurately describing the postmortem findings. Mackenzie, Griffith and Lavenson, Cautley, Plass, Phelps and Rosenthal have carefully reviewed the literature and collected all recorded cases of congenital anomalies of the esophagus. In 1931 Rosenthal collected 255 cases of congenital atresia of the esophagus. In 1933 O'Hare reported 281 cases and in 1941 Ashley collected 314 cases. Ladd in 1944 added 72 cases, bringing the total to nearly 400 cases.

In the literature are various classifications of congenital anomalies of the esophagus. Six such anomalies have been described.

1. Simple atresia of the esophagus.
2. Obstruction of esophagus due to a membrane.
3. Upper segment of esophagus ends in a fistulous tract entering the trachea just above its bifurcation and the lower segment begins again as a blind pouch.
4. Tracheo-esophageal fistula with no atresia of the esophagus.
5. Both upper and lower segments of esophagus end in fistulous tracts entering the trachea.
6. Congenital atresia of the esophagus with tracheo-esophageal fistula; the usual anomaly found in the esophagus.

In this most common type of atresia of the esophagus the upper segment terminates blindly just above the bifurcation of the trachea, while the lower segment has a fistulous communication with the trachea usually about 0.5 to 1.0 cm. above the bifurcation or more rarely with the bronchus. The upper culdesac is usually hypertrophied and dilated and has an average length of 3 to 4 cm. The lower segment of the esophagus at the cardiac end is usually of normal size but often diminishes in caliber toward its tracheal opening.

The symptomatology associated with this anomaly is so characteristic that it should be readily recognized. At birth the child appears to be well nourished and usually well developed but has difficulty with large amounts of frothy mucus filling the mouth and pharynx, and drooling from the side of the mouth. When fed, the child eagerly takes the breast and after a few swallows stops, ceases to breathe, becomes cyanotic, and regurgitates frothy mucus and feeding through the nose and mouth. The child appears as if it would drown, but after a period of lifeless relaxation usually recovers and repeats this episode with each subsequent feeding. These infants

rapidly lose weight due to starvation and dehydration and often develop an aspiration pneumonia. The diagnosis of atresia of the esophagus is readily made on the typical history, obstruction to the passage of a catheter at 10 to 12 cm. from the alveolar margins, and roentgenologic visualization of the blind pouch with instillation of lipiodol or by esophagoscopic examination. The presence of air in the stomach in cases of atresia of the esophagus indicates a fistulous communication with the lungs, whereas, the absence of air in the stomach would indicate a simple atresia of the esophagus without a tracheo-esophageal fistula.

A series of 21 cases of congenital atresia and congenital tracheo-esophageal fistula has been collected from the records of the University Hospitals and the department of pathology of the University of Minnesota for the 22 year period 1916 to 1938 inclusive. Twenty additional cases have been seen at the University Hospitals from 1939 to 1944 inclusive.

Three types of anomalies of the esophagus were found in this series:

1. Simple atresia of the esophagus (3 cases),
2. Tracheo-esophageal fistula with no esophageal atresia (2 cases),
3. The common type of atresia of the esophagus with associated tracheo-esophageal communication (36 cases).

The problems of treatment presented by each of these groups differ and will be discussed separately.

1. SIMPLE ATRESIA OF THE ESOPHAGUS

The obstruction in these cases may vary from a membranous diaphragm across the lumen of the esophagus to a partial or nearly total absence of the esophagus. In the former case, merely rupturing the membrane with the tip of an esophagoscope has been sufficient to effect a cure. In the latter case the problem is two-fold: 1) feeding; 2) care of the blind pouch of the upper esophageal segment. Gastrostomy should be sufficient for the purpose of feeding and should be done as soon as possible. The distance between the blind ends of the upper and lower segments of the esophagus is often too great to consider anastomosis of these segments. Exteriorization of the upper blind pouch of the esophagus, to form a cervical esophagostomy, should be done as a second stage procedure. An antethoracic esophagoplasty will later be necessary to establish continuity of the gastro-intestinal tract.

In the three cases of simple atresia of the esophagus in this series the upper segment of esophagus ended as a blind pouch at the level of the second thoracic vertebra

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and the blind end of the lower segment extended 2 cm. upwards from the cardia of the stomach. There was no connection between the two segments.

One case is alive and well at 11 months of age. A gastrostomy was made at three days of age and the upper segment of the esophagus was exteriorized as a cervical esophagostomy at twenty-five days of age.

Simple atresia of the esophagus is very rare but should be the most satisfactory to treat since there is no associated tracheo-esophageal fistula.

2. TRACHEO-ESOPHAGEAL FISTULA WITH NO ESOPHAGEAL ATRESIA

This rare type of tracheo-esophageal fistula presents the usual symptom associated with any fistula between the esophagus and trachea, namely, coughing and choking after swallowing liquids. Since the fistulous tract may be small and the symptoms inconstant, the diagnosis may be difficult to make before autopsy.

If the diagnosis of tracheo-esophageal fistula can be established, feeding by gavage may suffice to minimize the danger of aspiration into the air passages. Surgical correction of such a fistula could then be accomplished by exposure and ligation of the fistulous communication through a posterior extrapleural approach.

3. CONGENITAL ATRESIA OF THE ESOPHAGUS WITH TRACHEO-ESOPHAGEAL FISTULA

This type of atresia of the esophagus is the most common, occurring in 80 to 90 per cent of cases. The problem in these cases is three-fold: 1) feeding, 2) management of the fistulous communication of the lower segment of the esophagus with the trachea, and 3) care of the blind pouch of the upper esophageal segment. The various operations which have been suggested and attempted will be discussed briefly.

Gastrostomy has been the most frequent procedure used in these cases for the purpose of feeding. This alone has been insufficient because it does not answer the most important problem of regurgitation of stomach contents through the fistula into the trachea. To lessen this danger, passage of the gastrostomy catheter beyond the pylorus and well down into the jejunum has been suggested. In one case in this series in which this was the only treatment used, the patient survived 54 days. Jejunostomy has, likewise, been ineffectual in these cases.

Ligation of the esophagus at the cardia plus gastrostomy leaves a blind pouch of esophagus in which secretions will collect and empty into the trachea.

Transsection of the upper end of the stomach, abdominal esophagostomy and distal gastrostomy have been unsuccessful. Exteriorization of the cardiac end of the esophagus and stomach plus gastrostomy has resulted in ulceration of the exteriorized segment. In both of these procedures considerable difficulty presents in the management of the wound due to drainage of secretions from the gastric end of the esophageal stump.

Several methods of direct attack on the fistula have been attempted.

Endotracheal stenosis of the fistula by chemicals has been suggested. In one case of this series which is alive

and well, the fistulous communication of the esophagus to the trachea was identified through a bronchoscope and was coagulated by an electrode passed into the fistula. This did not result in an effective stenosis.

Lanman and associates ligated and divided the fistulous communication to the trachea through a right sided extrapleural approach, bringing out the distal esophagus as a dorsal esophagostomy and placing a catheter in this for feeding. In some cases proximal esophagostomy was added primarily or secondarily to prevent the overflow of secretions from the blind proximal end of the esophagus. This group of cases demonstrated that dorsal esophagostomy is not a desirable procedure since the blood supply of the mobilized distal segment of esophagus is definitely impaired. Simple ligation of the fistula at the trachea and gastrostomy should prove to be safer.

Early exteriorization of the blind pouch of the upper esophageal segment to prevent aspiration of secretions is of primary importance to prevent aspiration of saliva from the blind pouch of the upper segment.

The major disadvantage of ligation of the fistula at the trachea and cervical esophagostomy is the necessity of some form of permanent exterior esophagus.

The operation of direct anastomosis of upper blind pouch to lower segment of esophagus after division and ligation of the fistula to the trachea would be the ideal solution to the threefold problem presented by these cases. It closes the tracheo-esophageal fistula, takes care of salivary secretions, provides for feeding and restores the esophagus more nearly to normal than any other plan of operation.

The discrepancy in size of the two esophageal segments and the distance between the segments make this operation often difficult if not impossible.

Since 1939 Ladd and his associates have operated on 34 patients. Of these patients 6 have had primary anastomosis of the esophagus and 2 are living. Twenty-eight patients had the three-stage operation of obliteration of the esophageal fistula, gastrostomy and cervical esophagostomy; 9 of these are living.

Since 1939 Haight has operated on 24 of 28 patients seen at the University Hospital at Ann Arbor. A primary anastomosis of the esophageal segments was done in 16 of the 24 cases. Six of these patients were living, the oldest being the first successful case of primary end-to-end anastomosis recorded in this type of anomaly.

Humphrey has 3 patients living after the multiple stage operation and one patient alive after primary anastomosis of the esophageal segments.

Daniel of Vanderbilt also has one living patient after anastomosis of the esophagus.

Our cases of anomalies of the esophagus are divided into two groups. In the first group are 21 cases collected from the records of the University hospitals and the department of pathology of the University of Minnesota from 1916 to 1938 inclusive. In the second group are 20 cases which have been seen at the University hospitals from 1939 to 1944 inclusive.

GROUP 1 CASES

TABLE 1

Type of anomaly:	No. of Cases
Simple atresia	1
Tracheo-esophageal fistula with no esophageal atresia	2
Atresia of the esophagus with tracheo-esophageal fistula	18
Total cases	21

TABLE 2

Cases of atresia of esophagus with tracheo-esophageal fistula:

	Number	Average Survival Period
No operation	8	6.8 days
Operation	10	25 days

TABLE 3

Types of operations:	Number	Average Survival Period
Simple gastrostomy	5	6 days
Exteriorization or division of cardiac end of stomach	44	(maximum 98 days)

Study of these cases demonstrates: 1) that simple gastrostomy is of no value alone; 2) a type of treatment which takes care of the tracheo-esophageal fistula has been shown to prolong the life of these cases; 3) the method used to take care of the traceho-esophageal fistula in 5 cases was unsatisfactory.

In 1939, a more direct attack on the fistula was planned, and carried out successfully. This patient was the first with congenital atresia and tracheo-esophageal fistula that has survived.

It is of extreme interest that Ladd came to the same conclusions about methods of attacking this problem and adopted principles identical with ours. While our case is the oldest living patient, his oldest living patient is but a day younger than ours. It was two years after our operation that we learned of Ladd's case.

The procedure used in the first successful case will be briefly outlined. After a preliminary gastrostomy, an extrapleural ligation of the communication of the lower segment to the trachea is carried out. The proximal blind pouch of esophagus is exteriorized to make a cervical esophagostomy. This plan necessitates construction of an anter thoracic esophagus to re-establish the continuity of the gastro-intestinal tract. Ladd has successfully carried this out in two cases.

GROUP 2 CASES

Year	1939	1940	1941	1942	1943	1944	Total
Number of patients	2	1	3	3	6	5	20
No. operations performed	1					1	2
Gastrostomy		1a	3			1a	5
Ligation of fistula	1			3	6		10
End-to-end anastomosis						3	3
Living	1				3d	1a	5
Dead	1	1a	3b	3c	3e	4f	15

- a) Cases of simple atresia without fistula into trachea.
- b) One case showed cerebral sclerosis and was a Mongol.
- c) One case lived 27 months. Death was due to perforation of stomach wall by gastrostomy tube. One case had congenital atresia of the duodenum also.
- d) Two cases re-established continuity of fistulous tract and fistula was religated.
- e) In one case the exteriorized upper segment was not opened immediately and death was due to aspiration. Death in another case was due to perforation of stomach by the gastrostomy tube which had been drawn back out of the duodenum into the stomach.

- f) The 3 cases of primary anastomosis of the esophagus lived 7, 37 and 88 days. The first case developed a generalized edema on the third postoperative day and died. The second case developed an external esophageal fistula. A gastrostomy was made but hypoproteinemia developed with edema and death occurred at 37 days. The third case had an imperforate anus with a rectovaginal fistula. Swallowing of lipiodol demonstrated no fistula but at autopsy re-establishment of the tracheo-esophageal fistula was demonstrated.

In 2 cases in this second group no operation was performed. One patient died the day after admission and the other patient died three minutes after reaching the hospital. In both cases extensive bronchopneumonia was present.

COMMENT

Bronchopneumonia has been the most common cause of death in these cases.

A second cause of death is edema due to overhydration. Parenteral fluids must be limited to less than the amount that could be taken by a normal baby. A definite danger of development of pulmonary edema exists if much saline is given. Such edema developed in two cases following plasma infusions.

The sequence of operations is important. Because of a successful result in early cases in this series where early ligation of the fistulous tract and exteriorization of the upper blind pouch were considered elective procedures, this plan was adopted. After losing several cases in which only gastrostomy had been done, we learned that early treatment of the fistula was urgent and occasionally early treatment of the upper blind pouch may be of primary importance. This pouch, when exteriorized, should be opened at once.

Re-establishment of the tracheo-esophageal fistula occurred in 2 cases, four weeks after the operation of extra pleural ligation of the fistulous tract, when ligatures eroded through into the lumen of the esophagus. In both cases the operation was again performed dividing the esophagus. This should be done at the initial operation.

Primary anastomosis of the esophageal segments is the ideal operation, but cannot be done in all cases. The risk of this operation is greater than that of the multiple stage operation.

SUMMARY

A series of 41 cases of congenital atresia and congenital tracheo-esophageal fistula is reported.

The problems presented by these cases are reviewed and the various operations which have been attempted are discussed.

Five living cases are reported in this series.

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When you buy 7th War Loan Bonds for your boy's medical education, if you buy enough to pay for 3 years, Uncle Sam treats you and him to the fourth.

Convulsions in Infants and Children*

Age and Etiologic Incidence

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CONVULSIONS in infants and children may be related to and precipitated by a great variety of disease conditions. Yet the disease *per se* has not been shown to be the actual cause of the seizure. The same disease entity may be accompanied by attacks in one child, but not in another, although all other circumstances be identical in the two cases. The mechanism by which convulsions are produced in the apparently susceptible child is not known, nor is the nature of this peculiar susceptibility clearly understood.

This study does not represent an attempt to present a fundamental basis for convulsions, but rather to show the frequency with which seizures may be expected to occur at the various age levels as a part of the clinical picture of certain disease entities. The work entailed a review of 1,543 case records selected to include all of the clinical disorders in which convulsions are prone to occur. These varied from the common infectious diseases of infancy and childhood to rare disorders such as tuberous sclerosis and toxoplasmosis. The cases consisted of patients admitted to the pediatric service of the University of Minnesota Hospital during the last decade. A similar study of the age incidence of convulsions in children admitted to this hospital during the two previous decades has been reported by McQuarrie.¹

GROUP CLASSIFICATION

Because of the volume of the material under consideration, it was necessary in some instances, for purposes of classification and statistical arrangement, to condense several disease entities under a single head. Thus, Acute Infections include: pneumonia, acute otitis media, whooping cough, acute pyelonephritis, measles, etc.; Cerebral Atrophy: cerebral aplasia and agenesis, cerebral spastic paralysis, hydrocephalus, etc.; Head Injury: skull fracture, brain concussion and contusion, birth injury and subdural hematoma; Brain Tumors: cysts, abscesses and tumors; Miscellaneous: Sturge-Weber syndrome, cerebral sinus thrombosis, hypoglycemia, Schilder's disease, tuberous sclerosis, toxoplasmosis, convulsions of unknown etiology, congenital syphilis, renal and miliary tuberculosis, hysteria and anxiety neurosis, etc. Other groups such as the meningitides, poisoning, encephalitides, are self-explanatory and require no comment.

Diagnostic procedures which had been used in the cases studied included a complete history and physical examination. Neurological examinations had been carried out in all cases having convulsions. Routine urine analyses and blood counts had been done in all cases, and in most instances serum calcium and phosphorus and fasting blood sugar had been determined as well. When indicated, other diagnostic procedures such as x-ray of the

skull and long bones, pneumoencephalograms, bacteriological examination of blood, spinal fluid, urine, stools and exudates, the pitressin test, and glucose tolerance tests had been carried out. Pathological diagnoses were secured on a large percentage of the fatal cases and also from biopsy studies.

GENERAL CASE SURVEY

Of the 1,543 cases reviewed, one-half (775) were acute extracranial infections (table 1). Of these only 54 developed convulsions. This represents an incidence of 7 in every 100 cases of acute infection, the lowest percentage in the entire series. In this study, 210 cases were epileptic, organic epilepsy predominating (54.8 per cent). Thus about one of every seven cases reviewed was epileptic, this condition alone accounting for almost one-half (44.9 per cent) of all convulsive cases. Approximately 10 per cent of head and birth injuries had seizures. Roughly 50 per cent of the cases of meningitis suffered from convulsive attacks.

TABLE 1
Incidence of Convulsions in Various Clinical Categories

Group	Diagnosis	No. of Cases	Seizures		
			No. of Cases	Pct. of Group	Pct. of Total
1. Epilepsy	{ Organic ..	115	115	54.8	24.6
	Idiopathic ..	95	95	45.2	20.3
		210	210	100.0	44.9
2. Acute Infections (exclusive of meningitis)	..	775	54	7.0	11.6
3. Meningitis	..	93	51	54.8	10.9
4. Convulsions of unknown etiology	..	28	28	100.0	6.0
5. Brain tumors	..	53	22	41.5	4.7
6. Miscellaneous	..	63	18	28.6	3.8
7. Tetany	..	19	17	89.5	3.6
8. Encephalitis	..	41	16	39.0	3.4
9. Tetanus	..	18	16	88.9	3.4
10. Head and birth injuries	..	107	11	10.3	2.4
11. Glomerulonephritis	..	50	10	20.0	2.1
12. Cerebral atrophy	..	68	9	13.2	1.9
13. Poisoning	..	18	6	33.3	1.3
Totals		1543	468		100.0%

It is of interest to note that, whereas there were 775 cases of acute extracranial infections studied as against 93 cases of meningitis, the number of convulsive patients was practically the same in the two groups. The frequency of seizures in poisoning and glomerulonephritis is relatively high, the former having one convulsive patient in every three cases and the latter, one in every five.

Epilepsy, acute infections, meningitis and brain tumors combined account for almost three-fourths (72 per cent) of all convulsive cases.

AGE AND SEX

The age groups under consideration range from birth to sixteen years (table 2). The lowest age-incidence of convulsions occurred during the first six months of life

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TABLE 2
Age Incidence of Seizures and Predominant Causative Factor

Group	Age on Admission	Convulsive Cases		Diseases Having Highest Incidence of Seizures
		No. of Cases	Pct. of Total	
I	Birth to 1 month	13	2.8	Meningitis, 53.8%
II	1 to 6 months	45	9.6	Acute Infections, 28.8%
III	6 months to 3 years	135	28.8	Epilepsy, 37.8%—(Organic, 28.9%; Idiopathic, 8.9%)
IV	3 years to 6 years	76	16.2	Epilepsy, 46.1%—(Organic, 18.4%; Idiopathic, 27.7%)
V	6 years to 10 years	85	18.2	Epilepsy, 58.8%—(Organic, 7.1%; Idiopathic, 51.7%)
VI	10 years to 16 years	114	24.4	Epilepsy, 56.6%—(Organic, 4.4%; Idiopathic, 52.2%)
Totals		468	100.0%	

(12.4 per cent), the highest (28.8 per cent) during the period of six months to three years.

Forty-one per cent of all patients having seizures were under three years of age, 57 per cent were under six years, and 75 per cent were under ten years of age.

Taken as a whole the cases were almost evenly distributed between the two sexes, males being but slightly in excess (53.1 per cent). In isolated groups, however, males showed a definite predominance. For example, they constituted 94 per cent of 16 cases of tetanus, 74 per cent of 19 cases of head injury and more than 70 per cent of 17 cases of tetany. It is understandable that the greater degree of activity and exposure of males may be responsible for this predominance in tetanus and head injury.

AGE-ETIOLOGIC FREQUENCY OF CONVULSIONS

Of all cases studied, 468 (30.3 per cent) developed seizures (table 1). If meningitis is combined with acute infections, the acute febrile group will exceed all others in frequency during the very early period of life. For example, febrile diseases account for 61.5 per cent of all cases having seizures during the first month of life, 44.4 per cent from one to six months, 35.7 per cent in the six-month to three-year group, 18.4 per cent from three to six years, 8.2 per cent from six to ten years and only 7.1 per cent in the ten to sixteen-year group. This striking decline in frequency of febrile diseases as a cause of convulsions bears an inverse relationship to the degree of maturation of the patient, revealing as well, a greater incidence of acute infections in the younger age groups and a higher incidence of chronic convulsive disorders in the older age groups.

Wegman² suggests that the type of febrile illness, exclusive of intracranial infections, is not the significant factor in the febrile convulsions of the young, but that the rapid elevation in body temperature is the important element. He observed that kittens subjected to sudden rises in body temperature developed convulsions in a large percentage of cases, but found it difficult to duplicate this result when the temperature rise was gradual.

Epilepsy makes an initial appearance during the first six months of life, being essentially secondary to brain damage and accounting for 22.3 per cent of the seizures in this age group. The relative incidence grows rapidly with the increase in age, so that it holds first place from six months to sixteen years. Epilepsy is by far the commonest cause of convulsive attacks, for in the six- to sixteen-year age group, it alone accounts for over one-half

of all cases. It is of interest to note that during the first six years of life organic epilepsy exceeds the idiopathic type, whereas the latter is twice as frequent as the former from six to sixteen years.

Tetany appeared third in frequency in the youngest age group, ascended to second place between six and eighteen months, and rapidly declined to disappear after six years. Idiopathic hypoparathyroid tetany occurred in but one patient, a fifteen-year-old male.

Spontaneous hypoglycemia caused seizures in four of seven cases. One case was apparently related to Addison's disease, while another was cured by surgical removal of two small adenomata from the pancreas. Low blood sugar readings were observed in all instances, the first of the above mentioned cases reached levels below 20 mg. per cent and the latter, 33 per cent.

Rector and Jennings³ (1937), discussing the rarity of tumors of the pancreas with hyperinsulinism in children, mentioned that only one case in a child had been reported in the literature. Peterman⁴ reviewed a large group of infants and children with convulsions, and felt it strange that none of his cases was found to be due to hypoglycemia or hyperinsulinism. Rector and Jennings,³ however, reported eleven cases of spontaneous hypoglycemia of recurrent type associated with convulsions.

Darrow⁵ presented two cases of mental deficiency associated with convulsions and hypoglycemia, and concluded that because of roentgenological evidence of brain damage causing convulsions and a disturbance in the regulation of the blood sugar, the nervous symptoms (convulsions) should be related to the lesions in the brain rather than to the hypoglycemia. He cites these cases to demonstrate the difficulties involved in assigning a causative role to low blood sugar in the production of convulsive seizures. Of the four cases mentioned in the present study, only one showed evidence of probable brain damage (borderline hydrocephalus).

Because in many instances head and birth injuries as well as subsequent residua give rise to characteristic recurrent seizures, such cases are frequently classed under the head of organic epilepsy. In this series, birth injury was specifically assigned as the cause of convulsions only during the first month of life (23.1 per cent). Later (one to six months) it is included under cerebral atrophy or symptomatic epilepsy. Encephalitis appeared during the first six months (6.7 per cent), but reached a peak in the age group between three and six years (10.5 per cent) and disappeared by the tenth year, the chronic

form with recurrent convulsions then being classified under organic epilepsy. Brain tumors increased from 3.7 per cent between the ages of six months and three years to 10.6 per cent during the ten- to sixteen-year period. These lesions caused seizures in almost one-half of all such cases studied. Of the eighteen cases of hysteria studied, 22 per cent had seizures. Three of the convulsive patients were females, and all four cases were between the ages of ten and sixteen years. There were also two cases of anxiety neurosis, one of which had convulsions. Tetanus caused convulsions in 88.9 per cent of 18 cases studied, the remaining two patients showing such signs as trismus and meningeal irritation, but no typical convulsive seizures. Of 50 cases of glomerulonephritis, 20 per cent had convulsions and most of these presented the clinical and laboratory findings of uremia. No cases of convulsions were found to be related to worms, teething, phimosis, or allergy.

Other miscellaneous entities include the following: Schilder's disease, of 8 cases studied 6 had seizures. Sturge-Weber syndrome, of 3 cases studied 3 had seizures. Tuberous sclerosis, of 1 case studied 1 had a seizure. Congenital syphilis, of 3 cases studied 2 had seizures. Cerebral sinus thrombosis, of 3 cases studied 1 had a seizure. Toxoplasmosis, of 1 case studied 1 had a seizure.

INCIDENCE OF DEATH

A fatal result occurred in 104 (22.2 per cent) of all cases having convulsions. However, terminal seizures were definite in only 14 cases. Death occurred in males and females with almost equal frequency. Meningitis alone accounted for 47 deaths (45.2 per cent). These deaths were distributed as follows: tuberculous, 10; influenza, 10; pneumococcal, 12; all others, 15. Ten deaths occurred in tetanus (9.6 per cent). Only three of these were not complicated by pneumonia. Glomerulonephritis caused seven deaths, only one of these being complicated by pneumonia. The pneumonias accounted for six deaths (5.8 per cent). There were eight deaths due to brain tumor (7.7 per cent); five were due to birth and head injuries (4.8 per cent), and five were caused by poisoning (lye, 2; strychnine, 1; methyl salicylate, 1;

bromide, 1). Septicemia and otitis media caused three and two deaths respectively, while all other cases accounted for eleven instances.

Contributing heavily toward this mortality rate were several important factors. First, well over 80 per cent of these patients were in poor physical condition upon admission to the hospital, many being regarded as critical. Secondly, over one-half of the fatalities were primarily or secondarily precipitated by acute infections; and lastly, about two-thirds of all deaths occurred prior to the advent of sulfonamide and penicillin therapy.

SUMMARY

The hospital records of 1,543 infants and children treated at the University of Minnesota Hospital between the years 1933 and 1943 for the clinical disorders which are most frequently complicated by convulsive seizures were studied to determine the age incidence of different causative factors.

The largest group of cases studied (acute infections exclusive of meningitis) was found to have the lowest incidence of convulsions (7 per cent). Such febrile convulsions occurred almost exclusively in the younger age groups.

Convulsions occurred in 55 per cent of patients with meningitis, in 89 per cent of those with tetanus, in 39 per cent of those with various types of encephalitis and in 90 per cent of those with tetany.

Epilepsy was found to be the most common cause of seizures, constituting almost 45 per cent of the total number of convulsive cases. Although relatively unimportant numerically during the first six months of life this chronic convulsive disorder was found to be increasingly prominent in the older age groups. The incidence of organic epilepsy was relatively greater in the earlier age groups. The idiopathic type was seven to ten times as frequent as the organic type, however, in the older age groups.

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The Reading Disability: A Pediatric Problem*

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A READING disability may be highly significant in the physical complaints and emotional tensions frequently found in school children. While these complaints that are related to a reading difficulty may occur in any school child, they are most often found in children nine or ten years of age or older—boys and girls who are in the fourth, fifth, or sixth grades. From this point on, the ability to read assumes such an increasingly

important part in nearly every school subject that school success or failure depends upon it. A youngster unable to compete with his classmates because he cannot read finds himself at a real disadvantage, and repeated failure results in unhappiness for which he may try to compensate in various ways. He may develop into a "behavior problem," becoming sullen and negativistic toward his teacher and classmates. He may become "the bully," or may withdraw from contacts with the group. On the other hand, he may develop bizarre physical complaints

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varying from mild headaches (usually most severe early in the morning) to marked digestive disturbances, fainting spells, or convulsive-like seizures. He may manifest both emotional and physical symptoms.

A case recently encountered in the Pediatric Out-patient Department of the University of Minnesota Hospitals illustrates the point.

Dorothy, aged ten, came to the hospital with complaints of frequent sore throats, continuous fatigue, and backwardness in school. In addition to these symptoms, she cried often, was moody, and, of late, did not care to play with her former friends. She was extremely sensitive and resented the jibes and teasing of her sisters who referred to her as "dumb". At the time of referral she was half-way through the fourth grade and her marks were poor—noticeably poorer than in the preceding grade.

Dorothy's mother indicated that in her judgment the girl was slow. She added, however, that her daughter had always had trouble with reading.

Thorough physical studies were negative. Dorothy was referred for psychological testing which revealed, instead of a dull girl, one of high average intelligence. Her mental age at the time of study was thirteen months in advance of her chronological age. Although Dorothy's level of general intelligence was at the very upper reaches of the average range, tests of reading ability showed that she was reading at an early third grade level, a retardation of a year and one-half at a time when that degree of inadequacy is particularly critical.

The first step in the treatment of this unhappy youngster was to interpret the findings both to the child and to her mother. Since there were facilities in Dorothy's community where she could obtain the needed specialized help in reading, she was referred to the services available with a full report of the findings and recommendations. The latest account of Dorothy indicates that things are going well. Her physical complaints have been alleviated and she no longer cries and withdraws from social contacts.

Many similar case histories could be cited to illustrate the stellar role which reading difficulties may play in the etiology of the physical and emotional symptoms of some children. Authorities conservatively estimate that between 10 and 20 per cent of the children in our elementary and secondary schools cannot read adequately because of a specific disability.

A frequent error, not only of parents and teachers alike, but of the unhappy non-reader as well, is to think of the child as dull and stupid. Measured intelligence, however, and rapid school progress after remedial treatment have proven otherwise. These children of average or superior intelligence manifest a *specialized* disability in reading; they appear in contrast to the children who are *generally* retarded in intellectual development and whose slowness in learning to read accompanies slow progress in other intellectual functions.

The causes of reading disability are numerous and the specialists in this field are engaged in extensive research and discussion about them. Medical doctors can surely understand a situation of etiological argument!

Briefly the causes of reading disabilities can be discussed under four headings.

1. *Physical defects.* In a small but significant number of cases of persistent trouble there are uncorrected conditions of the eye or ear. It is important for the physician to look for muscular imbalance, which may cause a lack of fusion of visual images. Although fitted properly with glasses, some children need additional corrective eye-muscle training. Islands of deafness, which are often unrecognized, may likewise penalize the child.

2. *Poor or inadequate instruction.* An impressive number of reading problems are related to the fact that children vary in their ways of learning. Despite this, many school systems ignore this fact and adopt a standard method for teaching reading. It is well known, however, that children do not use visual, auditory, and kinesthetic imagery equally well; they can acquire facility in reading only when attention is paid to these differences, especially in the initial stages of learning. Moreover, the habit of moving the eyes from left to right in following the printed word is often left to chance, and the lack of guidance in establishing this habit is basic to some children's difficulties. The extreme use of the whole word or phrase approach, too, or the exclusive use of any analytic method, contributes markedly to the development of poor reading habits. A disregard for individual differences in the application of any teaching program inevitably handicaps some children and invites failure. The literature dealing with remedial reading methods reports dramatic successes when the individual needs of the child are recognized.

3. *Emotional problems.* The teacher's attitudes, particularly when colored by sarcasm, by sharp criticism, by favoritism, or by indifference may present an unfavorable setting for good learning. Parental over-concern or disparaging comparisons with other siblings may adversely affect motivation. These facts should be considered in each case.

4. *Cerebral dominance.* The theories of causation due to left-handedness, to mixed eye-hand dominance, or to the failure to establish dominance in the cerebral hemispheres have been open to serious question and criticism. They form, perhaps, the strongest focus of controversy at the present time in this field.

While there are many causative factors in reading disabilities, most, if not all, of these difficulties can be relieved by appropriate guidance. The first step, however, is to recognize the problem. It is astonishing how many times this special disability is overlooked by the school. Therefore, the development of the emotional and physical tensions already mentioned will often bring the child to his physician, who, by his awareness of the ramifications of reading disabilities, can do much to help the child.

There are several ways of uncovering the possible existence of a specialized delay in reading. The point of the search is the discovery of a discrepancy between general intelligence and achievement in areas not dependent upon reading on the one hand, and a special reading disability on the other. A physician who understands the norms of behavior can obtain a rough estimate of general capacity by making a careful inquiry into the child's developmental history and present performance. An investigation of the school achievement from kindergarten to the present grade may also yield pertinent information. As indicated above, this is particularly true if the child has begun to have trouble in the fourth or fifth grade when reading begins to take a place of primary importance in school work. In case of doubt, a well-chosen battery of tests given by a competent, well-trained person—either in the school system or in a children's clinic—can define the problem with greater accuracy. Such a definition makes possible a plan for remedial reading in conjunction with other recommendations felt necessary by the physician.

One word of caution is advisable. Poor, inadequate tutoring is worse than none at all. Likewise, any attempt by a member of a child's own family to tutor him should be discouraged. Such procedures serve only to push the disabled reader deeper into his feeling of certain failure and inability to learn.

A reading disability may play a prominent role in the etiology of emotional and physical complaints of many children. The physician alert to this fact can be of immeasurable assistance not only to the child under his care, but also to the child's family and the community.

Jaundice in Infancy and Childhood*

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WHETHER the appearance of jaundice clarifies or confuses any particular clinical problem depends on many factors, including the physician's training and experience with certain diseases, his knowledge of bile metabolism, correct application and evaluation of pertinent diagnostic tests.

The characteristic staining of tissue due to excess circulating bile pigment may be recognized at various individual "threshold" levels; these are apt to be peculiarly higher in infants and children than in adults.¹ In the newborn, for example, very close scrutiny may show no visible discoloration of the skin and sclerae when the serum bilirubin is several times greater than that accompanying obvious jaundice in an adult. Very mild degrees of jaundice may therefore be expected to have greater diagnostic significance in young subjects. Factors responsible for this apparent age difference in the affinity of tissues for adsorption of circulating bile pigments have not been elucidated.

I. METABOLISM OF BILE PIGMENT

Accumulation of bilirubin in the circulation depends on excessive production or faulty disposal. Originating from breakdown of hemoglobin throughout the reticuloendothelial system, the *heme* fraction yields iron-containing hemosiderin and *bilirubin*. Free in the circulation, this bilirubin enters into loose physical combination with plasma protein: *hemobilirubin*. This adsorbed (nondiffusible) form of bilirubin is normally present in plasma in a concentration of 0.2 to 1.0 mg. per cent; it gives an indirect van den Bergh reaction and cannot pass the normal renal glomerulus.

When this combination of bilirubin and protein arrives at the liver, it is again broken down, now yielding a diffusible "direct" bilirubin, sometimes called cholebilirubin. Excreted into the bile ducts, this passes into the intestinal lumen, where bacterial action causes change to greenish *biliverdin*, finally *stercobilin* (fecal urobilinogen).

Watson has shown that the normal adult excretes 50 to 250 mg. of fecal urobilinogen daily.² Tat, Greenwalt, and Dameshek³ studied the output of bile pigments in infants and children and found the excretion of urobilinogen to be very low. In normal infants, there appears to be a reciprocal relation in the output of bilirubin and urobilinogen in the feces; bilirubin normally disappears from the stool at about the seventh month of life. Under two years of age, most infants excrete less than 2.5 mg. of urobilinogen in the feces daily, and children up to eleven years only 2 to 7 mg. per day. Reasons for such striking differences in output of fecal urobilinogen by children and adults have not been clarified but include such factors as difference in diet, rate of digestion, hepatic function, and greater need for hemoglobin "building stones" in the young.

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Some of the soluble urobilinogen in the intestinal tract is picked up by the portal circulation and returned to the liver, where it may be stored, re-excreted, or destroyed. A small amount reaches the general circulation via the hepatic veins; being diffusible, it appears normally in the urine as urinary urobilinogen (1 to 2 mg./day). Children also excrete relatively less than adults by this route. Damage or disease of liver cells allows increased amounts of urobilinogen to gain access to the circulation and appear in the urine.‡

Since maintenance of a normal level of serum bilirubin is dependent on accurate integration of many processes, it is not surprising to find jaundice as a rather common manifestation in a number of diseases. Regardless of the mechanism for its production, jaundice almost always indicates some degree of liver dysfunction. An increase in serum bilirubin may be brought about by one or more of the following mechanisms:

1. Such large quantities of hemobilirubin are brought to the liver—the result of excessive destruction of blood—that the functional excretory capacity of that organ is exceeded: hemolytic jaundice.

2. Because of obstruction some place in the biliary tract, cholebilirubin cannot reach the intestinal lumen and accumulates in (regurgitates back to) the blood stream: obstructive jaundice.

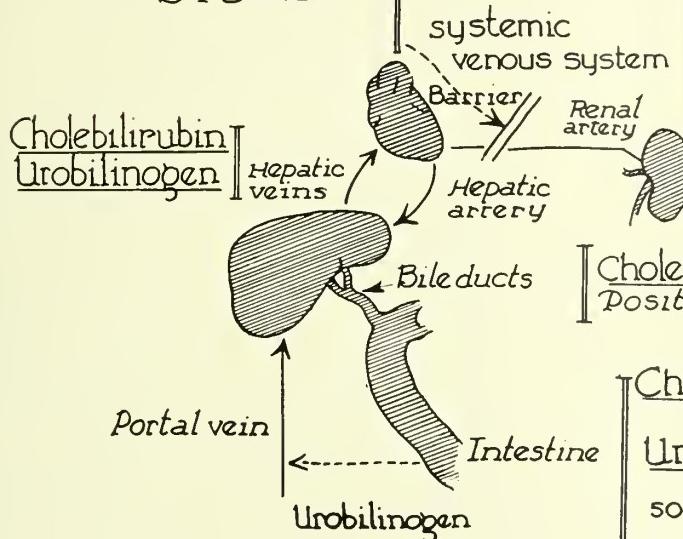
3. Damage or disease of the liver limits its ability to take up even normal amounts of hemobilirubin or excrete normal amounts of cholebilirubin. Accumulation of these in varying proportions may simulate hemolytic or obstructive syndromes: hepatogenous jaundice.

Suspicion of hemolytic jaundice arises through recognition of certain etiologic factors and the demonstration of excessively rapid destruction of red blood cells, of compensatory hematopoiesis, of characteristic disturbances in bile metabolism. In these cases one should note obvious anemia, varying degrees of icterus, sharply decreased or falling hemoglobin and erythrocyte count, spherocytosis, increased fragility of the erythrocytes, increased numbers of immature red cells in the peripheral blood and marrow, increased circulating hemobilirubin (indirect van den Bergh), high icteric index, increased fecal and urinary urobilinogen output. An accurate history and careful examination usually suffice to make a presumptive diagnosis, but laboratory confirmation is always desirable and often necessary.

With complete obstruction or severe hepatocellular damage, the jaundice is usually more intense; cholebilirubin frequently accumulates to levels of 30 to 50 mg. per cent with icteric indices as high as 200. Some of the regurgitated cholebilirubin may even re-combine with

‡Urobilinogen, as it appears in the urine, is rather unstable; exposed to air and sunlight, it changes rapidly to urobilin. If determination of urinary urobilinogen is to be used as a measure of liver damage, then quantitative examination must be carried out on a freshly voided or properly preserved sample of urine.

RETICULO-ENDOTHELIAL
 spleen, lymph nodes,
 marrow, omentum (liver)
SYSTEM



Hemobilirubin
 Adsorbed on plasma protein
 $0.3\text{--}0.7 \text{ mg./100 c.c.}$
 Icterus index 5-10
 Negative "direct reaction"

Urine urobilinogen
 $1\text{--}2 \text{ mg./day}$

Cholebilirubin
 Positive "direct reaction"

Cholebilirubin
 ↓
Urobilinogen
 (stercobilin)
 $50\text{--}200 \text{ mg./day}$
 in stool

Fig. 1. Paths in bile pigment metabolism.

plasma protein to give the indirect diazo reaction again. When bile pigment fails to enter the intestinal tract for either cause, fecal urobilinogen decreases to a mere trace, and urinary urobilinogen may disappear entirely, though bilirubinuria persists.

With varying degrees of obstruction and liver damage, these findings may be equivocal; fecal and urinary urobilinogen may be normal. Increase in both urinary bilirubin and urobilinogen suggests that hepatic damage rather than biliary obstruction predominates.

With hepatogenous jaundice, one should expect to find excessive amounts of both hemobilirubin and cholebilirubin in the blood stream. The same factors responsible for the liver damage may initiate hemolysis of red cells; damage to liver cells may simultaneously interfere with secretion of hemobilirubin, allow cholebilirubin to leak back into the blood stream, and also prevent bile pigment from entering the intestinal tract.

With all these overlapping features, one can usually speak only of predominantly hemolytic, obstructive, or hepatogenous jaundice. Hemolytic types are most frequent in children. Obstructive jaundice in infancy is generally found only with other distinctive features of congenital malformation of the bile ducts. Fortunately, pediatricians are rarely confronted with the serious clinical problem of differentiating between obstructive causes of jaundice for which surgery is indicated and hepatogenous causes which strongly contraindicate operative intervention.

II. SOME TESTS OF LIVER FUNCTION IN JAUNDICED PATIENTS

Tests of liver function based on excretion of *any* dye from the blood stream into the biliary tract are theoreti-

cally and technically unsound in the jaundiced patient.

The *hippuric acid test*⁴ is frequently difficult to evaluate. Detoxification of an excessive amount of benzoic acid to hippuric acid by combining the former with glycine measures the functional capacity of the liver to manufacture glycine. It usually fails to differentiate hepatitis and chronic biliary obstruction and depends furthermore on adequate intestinal absorption as well as a normal urinary output. Cumbersome though it may be, this test is sometimes useful as an index of liver damage in children.

While it is true that the blood *cholesterol* is usually elevated in obstructive jaundice and the ester fraction is reduced with hepatocellular damage, interpretation of these must usually depend on the observed trend over a series of determinations. Cholesterol levels cover a wide range in normal children, and the esters may be reduced by various infections.

Evaluation of impaired glycogenolysis by carbohydrate tolerance tests or following the injection of adrenalin have limited usefulness in differentiating types of jaundice. Liver damage is judged to be present if more than three grams of galactose appear in the urine after the ingestion of forty grams. When jaundice has been present for a week, results of this test are usually negative. Of course, many children have transient and various degrees of glycosuria spontaneously with any type of liver disease.

The serum *alkaline phosphatase* is often greatly increased with obstructive jaundice; moderate increases may be seen with incomplete degrees of obstruction. Levels are usually not affected when jaundice is due only to liver damage.

The importance and usefulness of estimations of urinary and fecal urobilinogen have been emphasized and

TABLE 1

	Fecal Urobilinogen	Urinary Urobilinogen	Urinary Bilirubin
Normal			None
Adult ²	50-250 mg./day	1-2 mg./day	
Infants, to 2 yrs.	2.5 mg./day		
Children, 3-11 yrs. ³	2.6 mg./day		
Hemolytic Jaundice	Increased	Increased	None
Obstructive Jaundice	Trace or none	None	Increased
Hepatogenous Jaundice	Trace, normal, or positive	Trace, normal, or positive	Increased

expected changes are shown in Table 1. The reader is referred to other papers for more complete quantitative data.^{2,3}

A reduction in prothrombin eventually occurs with obstructive jaundice, due to impaired absorption of vitamin K from the intestine. With severe damage, the liver may be unable to synthesize prothrombin. Adaptations of the simple test for prothrombin level following orally and parenterally administered vitamin K could be more widely used in the study of jaundiced patients, particularly when there is confusion in differentiating primarily obstructive and hepatogenous types. If a lowered prothrombin level is elevated by parenterally administered vitamin K after failure by the oral route, it would seem logical to assume that the liver is responsible, and that the prothrombin deficit is due to obstruction.

Decreasing albumin and increasing globulin levels may indicate hepatic damage, provided other factors which can produce these changes are excluded.

III. SOME DISEASES OF INFANCY AND CHILDHOOD EXHIBITING JAUNDICE AS A PROMINENT MANIFESTATION

In *hemolytic disease of the newborn* (erythroblastosis fetalis), jaundice present at birth or appearing within forty-eight hours is a most characteristic feature. Most cases result from a process of isoimmunization, as illustrated by the now familiar Rh relationship. Though manifestations of this disease are protean, excessive hemolysis with the appearance of pallor and jaundice are most regularly noted.

Aspects of prematurity are outstanding; secondary features include hemorrhagic manifestations and signs of compensatory hematopoiesis, such as erythroblastemia, enlargement of the liver and spleen, circulatory failure, appearance of "shock", or asphyxia. Edema of more than physiologic degree is rarely encountered except in severe cases—stillborn or dying so early that effective therapy cannot be instituted.

The most important warning signals, permitting the clinician to anticipate the disease before delivery of the infant, include a history suggesting its occurrence in previous pregnancies, transfusion reactions in the mother at any time, and a proved basis for isoimmunization.

It should be remembered that erythroblastemia is only a feature of compensatory hematopoiesis, and though it is present as a valuable diagnostic and prognostic sign in the majority of cases, its absence does not rule out the diagnosis. Erythroblastemia may be lacking in the most fulminating cases. In those more benign, with slower

hemolysis and milder symptoms, jaundice and erythroblastemia may go unrecognized.

Pertinent laboratory studies should demonstrate a rapidly declining hemoglobin concentration and red blood cell count, increasing bilirubinemia, increase in bile excretion by all routes, an early indirect van den Bergh reaction, and usually the presence of agglutinins in the maternal serum against the infant's red cells. Compensatory or secondary features, such as erythroblastemia, hyperplastic marrow, leucocytosis with immaturity, reduced prothrombin level and platelet count, and evidences of myocardial, hepatic, renal, or cerebral damage, may also be encountered.

Therapy consists of early and adequate transfusions, given as often as necessary to maintain an effective hemoglobin level of 10 grams or more, prevention of hemorrhage by this means as well as by intravenous administration of vitamin K, oxygen, and conventional supportive care always indicated for premature infants.

With early recognition and proper therapy, prognosis may be good. The dangers of residual cerebral degenerative changes (kernicterus) and cirrhosis have almost certainly been overemphasized in the past.

Physiologic jaundice of the newborn usually appears after thirty-six hours and before the sixth day; it may be intense in 30 to 40 per cent of infants, in whom the level of serum bilirubin exceeds 4 to 5 mg. per cent.⁵ It is usually most obvious and prolonged in those prematurely born. There seems to be no doubt that this icterus is due to rapid blood destruction and temporary inability of the liver to "keep up" with excretion of the resultant excess bilirubin. Aside from the time at which such icterus appears, the most valuable identifying characteristic is the obvious complete well-being of the infant.

The icterus index may be very high; quantitative studies show a high serum bilirubin of indirect type, which slowly declines. The stool contains excess bilirubin, and bilirubinuria is common. There are no symptoms or other abnormal signs in the uncomplicated case. The appearance of physiologic jaundice coincidentally with any other disease in this age period is apt to confuse the diagnosis or lead to erroneous conclusions.

The prognosis, of course, is uniformly excellent; the jaundice usually clears in two to three weeks but occasionally persists longer. We have recently seen it remain for four months in a prematurely born infant.

Obstructive jaundice in infants is almost always caused by congenital malformation, occlusion, or absence of the bile ducts; occasionally cases may be attributed to unduly viscous inspissated biliary secretion and inflammatory scarring.

Usually the early features are nothing more than apparent physiologic jaundice; during the second and third weeks, however, there is progressive and obvious increase in jaundice rather than the expected clearing, and other features of obstruction become prominent: acholic stool, dark urine, anorexia, vomiting, hemorrhages, weight loss, marked enlargement of the liver, and eventual cirrhosis. The directly reacting bilirubin reaches extreme levels, serum phosphatase rises progressively, and tests of liver function show irregular abnormalities. Severe anemia

appears, with decreased fragility of red blood cells, deficiency of prothrombin, and prolongation of bleeding and clotting time. Exploratory laparotomy should always be done as soon as the diagnosis is made, because some of the abnormalities causing obstruction can be surgically corrected. Fat-soluble vitamins should be given parenterally, and hemorrhagic manifestations prevented or treated by parenteral vitamin K and blood transfusions.

Jaundice caused by congenital syphilis has been very unusual in our recent experience § with syphilitic infants and has never been a prominent clinical feature. Diffuse interstitial or gummatous hepatitis is one of the commonest pathologic features found in infants dying with congenital syphilis, and its presence in some living cases is often suggested. In 60 infants with congenital syphilis, we encountered 3 or 4 plus flocculations sixteen times. These showed no apparent correlation with clinical severity of the infection, age of the patients, presence of jaundice, or evidences of liver damage. These results cannot be interpreted until more data are accumulated from non-syphilitic infants for comparison.

The jaundice we have noted in early congenital syphilis appears clinically to be no different from that described as physiologic, except that it may persist slightly longer. We have seen no proved examples of resultant true interstitial cirrhosis. The other diagnostic symptoms and signs of congenital syphilis almost completely overshadow the very questionable diagnostic significance of jaundice or hepatomegaly.

In the absence of epidemic or endemic relationships, it may be difficult to recognize and diagnose properly acute catarrhal jaundice. Clinicians and pathologists generally agree that the problem of differentiating this benign condition from fulminating acute yellow atrophy is essentially one of grading. Its frequent association with various infections suggests that the manifestations are not specifically related to any single one, and a satisfactory etiology cannot be established for the majority of cases. This of course implies that some yet unrecognized virus may be responsible. The disease usually occurs between the third and fifteenth years and is characterized by a rather vague, insidious, mild onset with low-grade fever, nausea, vomiting, diarrhea, and pain over the liver. After three or four days, the fever slowly declines, with appearance of jaundice most noticeable in the sclerae. Pruritus, bradycardia, and changes in blood pressure are unusual in children. There may be extreme tenderness and transient enlargement of the liver. A nondescript morbilliform rash occasionally appears. Hepatocellular damage may be so severe that bile pigment fails to enter the intestinal tract—simulating complete obstruction of the biliary tract. The icterus index of the serum is high, with bilirubin giving a direct or biphasic reaction. There may be other objective evidences of liver damage, with defects in prothrombin leading to occasional hemorrhagic manifestations. Glycosuria and acetonuria are common. Serum from these patients frequently yields significantly high titers of heterophil antibodies. The cephalin flocculation test is uniformly strongly positive.

§Unpublished data on treatment of congenital syphilis with penicillin.

After a week or two all symptoms subside, though visible jaundice and slight enlargement of the liver may persist longer. During the acute febrile phase and certainly until objective studies exclude serious manifestations or other causes of jaundice, these children should remain in bed and have a high carbohydrate diet reinforced with intravenous glucose if necessary. Routine administration of vitamin K is justified. Once fever and early symptoms have subsided, the diagnosis is usually obvious. Further rest and dietary regulation beyond this stage probably do not affect the rate of recovery. Complications are unusual, though very occasional cases of mixed cirrhosis may occur; we have seen only one example in which this relationship seemed clear.

Weil's disease (leptospirosis) is occasionally encountered, but we suspect many more cases than we are able to prove. Usually acquired from ingestion of the organism or contact with urine of infected rats (barefoot children, puddle-wading, rice-fields), the disease is characterized by sudden onset of severe chills, fever, nausea, vomiting, pain in the muscles and abdomen (liver); the latter may be excruciating. The incubation period is about one week. Meningismus is common, and there may be widespread hemorrhages. Enlargement of liver and spleen is an inconstant feature. Jaundice may be entirely absent but usually appears early, resembling the severe "catarrhal" type with uniformly strongly positive cephalin flocculation tests. False positive Wassermann reactions are commonly noted, and leptospirae may be isolated from blood (first six days) or urine (after twelfth day) by direct dark field examination or by appropriate animal inoculations. Routine urinalysis frequently demonstrates features of acute pyelonephritis. Anemia and leucocytosis are usually extreme. Late in the disease or in convalescence, the diagnosis may be confirmed by appropriate complement fixation or agglutination reactions. Early treatment with convalescent serum or arsphenamine has been recommended. The disease usually runs an acute course of about two weeks, with slow convalescence. Mortality rates as high as 40 per cent have been reported, and prognosis is roughly related to the intensity of jaundice.

L. canicola infections may resemble Weil's disease closely but can be differentiated by demonstrating the etiologic agent or by specific agglutination reactions.

Jaundice caused by sepsis, while unusual, is almost always a very late and ominous prognostic sign appearing in the course of an obvious, overwhelming infection. A moribund, athreptic, icteric infant who was recently admitted with innumerable metastatic abscesses and staphylococcal bacteremia provided a classic example. Such cases are also occasionally encountered with pneumonia, large infected burns, peritonitis, or tetanus. It seems obvious that many cases so diagnosed in the past have in reality been examples of hemorrhagic disease of the newborn; certainly proved instances due to sepsis are comparatively rare nowadays. The jaundice is most often of a combined hemolytic and obstructive type, and evidences of hepatic dysfunction may be extreme. Bilirubin is increased in both urine and stool and gives a biphasic reaction in the serum. As previously stated, jaundice and

other evidences of liver damage usually appear as late serious prognostic signs, though in an occasional case they may overshadow other features. Demonstration of a septic focus and a positive blood culture should clinch the diagnosis. Therapy is of course primarily directed at the causative infection with appropriate sulfonamide or antibiotic and additional measures, such as infusions of glucose containing vitamins K and C and repeated small transfusions.

Various hemolytic syndromes (familial jaundice, sickle cell disease, Cooley's anemia, acute hemolytic anemia of Lederer) may exhibit jaundice as a prominent feature; here the diagnosis can only be established by fulfilling specific criteria for each. It is very unusual to detect recognizable clinical features of familial jaundice during the first five years. We have frequently encountered crises with sickle cell disease among older infants and toddlers, and most cases present pathognomonic features at some time during childhood. Splenectomy may be justified after hemolytic crises have occurred early in life. Our clinical observations following this procedure are encouraging, though enough time has not elapsed for final evaluation. Besides characteristic hematologic features peculiar to each of these syndromes, there are variable high levels of serum bilirubin, giving the indirect or delayed van den Bergh reaction; fecal and urinary urobilinogen are increased; splenomegaly is prominent.

Acute hemolytic anemia (Lederer) is characterized by sudden onset of severe anemia with jaundice, sometimes for no apparent cause. While fatalities occur in rare severe examples, most cases respond dramatically to transfusion, with rapid recovery. Associated hemorrhagic manifestations, splenomegaly, and cardiac failure may be prominent. Evidences of rapid blood regeneration usually appear at the height of the disease.

Exogenous factors producing jaundice include, aside from infections, mismatched transfusions, certain poisons, and drugs. Sulfonamides, phosphorus, and the arsphenamines are the drugs most likely to produce hemolytic anemia or severe liver damage and jaundice of

mixed type; chloroform is rarely used as an anesthetic agent at present, and we have encountered no examples of jaundice due to this agent. Following more than two thousand injections of mapharsen and sulfarsphenamine in infants and children, we have found no cases of jaundice or other serious toxic manifestations related to these drugs.

Phosphorus remains the commonest poison responsible for severe liver damage; most of these cases develop after accidental ingestion of roach or rat poison. Following a brief latent period with evidences of gastric irritation, features of acute yellow atrophy develop—intense jaundice, severe hemorrhagic manifestations, hypoglycemia, delirium, convulsions, coma, and death. There is apparently a wide range of susceptibility to the effects of this poison, and very small doses have led to fatalities. Emetics, complete gastric lavage with 1:1000 permanganate, high carbohydrate diet, and intravenous glucose should be administered *on suspicion*. Once jaundice has appeared, mortality is high. The clinical features are identical with those seen in acute yellow atrophy.

Sulfonamide drugs are apt to cause hemolysis and enough liver damage to result in visible jaundice, with increased excretion of fecal urobilinogen. Appearance of jaundice during administration of these drugs contraindicates their further use and calls for vigorous measures to support liver function.

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The American College of Surgeons announces that 3,152 hospitals in the United States and Canada are included in the 1944 approved list. A total of 3,911 hospitals were included in the 1944 survey and the approved hospitals represent 80.6 per cent. The first annual survey in 1918 included 692 hospitals of 100 beds or over of which only 89 or 12.8 per cent merited approval. Hospitals of 25 beds and over are covered in the current surveys. On December 31 of each year the ratings of hospitals under survey by the American College of Surgeons automatically terminate. The status of every hospital based upon all data collected from the current survey is reconsidered each year. The government has in contemplation subsidizing state hospital surveys (see Federal-State Programs for Child Health and Medical Care, page 205 in this issue).

Chickenpox Encephalitis*

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BECAUSE central nervous system complications of chickenpox are far from common and because there are several interesting features concerning them, a case of chickenpox encephalitis is here reported with a discussion of some of the aspects of this disease.

A nine-year-old girl developed the first lesions of chickenpox on May 10, 1944. She was a healthy child, had had no unusual illnesses and had had uncomplicated measles three months previously. The disease followed the expected course except that it was severe, in that she had very numerous lesions, with many on the mucous membranes of the mouth, throat and genitalia. She was extremely uncomfortable and ran a moderately high fever during the first few days. On the seventh day of the disease when her temperature had been normal forty-eight hours or more, her lesions had dried or become scabbed and she was apparently well, she suddenly developed a temperature of 101° with severe headache and vomited once. The following day she was afebrile, had no headache but felt very dizzy all the time and staggered when she walked. At this time she was not particularly uncomfortable and was amused by her peculiar disability. However, during the next twenty-four hours she started to vomit and vomited persistently at least once an hour whether she took anything by mouth or not. She also developed more vertigo and staggered so that she could scarcely walk. She was then admitted to the hospital. Her symptoms became worse for about forty-eight hours and then gradually improved.

During her hospitalization she had an entirely afebrile course. Physical abnormalities, except for the healing chickenpox lesions, were limited to neurological findings. She was quite drowsy, would answer questions only after a delay and very slowly. She tended to forget the details of a few hours before but was well oriented as to location. Her neck and back were at no time stiff. Kernig's were negative. Pupils were equal and reacted to light and accommodation. Eyegrounds were normal. There was an occasional inconstant rotary nystagmus. The general muscle tone was poor so that tendon reflexes were hard to obtain but at times these were present and normal. Babinski's were negative. However, there was a marked ataxia as shown by point to point tests and positive Romberg. She could follow instructions, though slowly, and anything she was asked to do brought out her extreme ataxia. When sitting, she could not hold herself upright but swayed from side to side and then fell. When asked to extend an arm or leg or reach for anything, she would go through a wavy and devious path and could not sustain the position.

Urine, blood count and sedimentation rate were normal. The spinal fluid, taken on the fifth day of the encephalitis at the height of the symptoms, was also normal.

*Read before Northwestern Pediatric Society, September 29, 1944.

The pressure was 110 mm. of H₂O, there were 4 mononuclear cells; the protein was 17.0 mg. per cent; sugar 79.5 mg. per cent, culture sterile.

For the first five days of hospitalization it was necessary to maintain her hydration by intravenous and rectal fluids because of the persistent and violent vomiting. After that she was able to retain sufficient quantities by mouth. On the fourth hospital day she was less drowsy but still vomiting and ataxic and by the ninth hospital day, or twelfth day of encephalitis her slowed and dulled mentality had returned entirely to normal and the ataxia was enough better so that she could get in and out of bed though with considerable unsteadiness. At the end of three more weeks there was a minimal ataxia and a slight nystagmus; at the end of the sixth week there were no residual signs at all and she has remained perfectly well to date. It was concluded that this was a case of chickenpox encephalitis with most of the brain involvement occurring in the cerebellum.

By far the best and most complete discussion of chickenpox encephalitis is found in an article by E. Ashworth Underwood.¹ His article consists of a complete analysis of 119 cases from the literature, plus one case of his own. His appendix summarizes briefly 12 or more cases, bringing the total up to 132 cases reported through 1935. These cases have been presented from all aspects; that is, course, prognosis, laboratory, pathology, epidemiology and etiology. Therefore, the few remarks I shall make are based principally upon this work. Since that time, 40 more cases have been reported and of these^{2,3,4,5,6} eight are in the American literature. The others are mainly European.

There is no reported series of chickenpox cases large enough or representative enough to give an accurate estimate of the percentage which develop central nervous system complications. The nearest we can come to it is from a summary by Bullowa and Wishik⁷ in which they report five cases of encephalitic complications in 2,534 hospital admissions for chickenpox, or an incidence of about 0.2 per cent. However, I feel sure that this incidence would be considerably lower in a series of cases taken at random. The occurrence of chickenpox encephalitis does not seem to be influenced by the age or sex of the patient or the season of the year, but the complication is more likely to arise following a severe attack of chickenpox than after a mild attack. Also, an individual who has suffered a previous disturbance of the central nervous system may be more susceptible to an encephalitic complication.

The most interesting fact about this subject is that chickenpox of the central system may take one of several forms. These have been classified and divided into six major divisions by Underwood,¹ as follows:

1. Meningo-encephalitis. A patient with this form of

the disease will have meningeal signs as well as those of encephalitis, i. e.: convulsions, drowsiness, coma, etc.

2. Pure encephalitis which may take one of several forms: a) Lethargic encephalitis where the involvement is mainly cerebral with convulsion, drowsiness or coma and eye signs. b) Acute cerebral tremor in which there may be an acute tremor of one or more parts of the body and muscle spasm. c) Cerebellar syndrome in which the involvement is limited to the cerebellum and the patient has ataxia, vomiting, vertigo, speech changes, nystagmus. d) Choro-athetotic forms in which the symptoms are those of a chorea. e) Non-characteristic encephalitic forms.

The second group, that is, the pure encephalitic forms, compose half of the cases of chickenpox complications in the nervous system. Within the group, the cerebellar syndrome occurs by far the most frequently. The case I have just reported obviously fits into this cerebellar syndrome.

3. Myelitis which may show the neurological picture of a) typical ascending or transverse myelitis, b) anterior poliomyelitis, c) multiple sclerosis.

4. Neuritis or polyneuritis.

5. Ocular manifestations such as paralysis of eye muscles, ptosis, neuroretinitis or optic neuritis.

6. Other conditions not classified and which will obviously include any of the neurological complications classified in the above.

Aside from any one of the above types, one may find, and often does, an encephalitis which shows the characteristics of two or more of these. The course of the disease varies with the form it takes. In general, one may expect an interval of one week to two or three months before complete recovery occurs or before it can be said that the patient will have some permanent residual. A few cases are fatal and death may occur anywhere from a few hours to two or three weeks after the onset. As could be expected, there is no specific therapy and the patient must be treated symptomatically.

The onset of the encephalitis in relation to the chickenpox may be from a few days before to two or three months after the first appearance of chickenpox lesions.

However, by far the greatest number of cases have their onset from the fourth to the tenth day of the chickenpox.

The only laboratory investigation of significance is that of the spinal fluid. Probably a small majority of cases have normal fluids. The abnormal findings may be pressure, slightly to markedly increased, cells varying from a very few to 80 or more, usually with a predominance of mononuclears, protein slightly to markedly increased, and sugar occasionally elevated. The pathology from autopsies on the few fatal cases shows such a variable picture that it can be said only that there is no pathological picture absolutely characteristic of chickenpox encephalitis.

Prognosis of this disease in general is only fair. Twelve of 107 of the cases reviewed by Underwood died. Sixteen cases, or 15 per cent, showed permanent sequelae of various types; there was complete recovery in 73 per cent. Complete recovery is most common in the cases classified as the cerebellar syndrome and least common in the groups with myelitis and eye complications. Bergman and Magnusson⁸ briefly summarized the cases in the literature between 1933 and 1939 and then added 10 of their own. They were considering the disease largely from the point of view of prognosis and found a mortality of 3 in 25 cases from the literature and, in 1 of their 10 cases, a mortality corresponding very closely with that of Underwood. Their other 9 cases recovered completely and were all normal when followed up several years later. None of these cases, however, fall into the groups which Underwood considered most likely to leave sequelae.

We can conclude that chickenpox encephalitis is an unusual condition in which the prognosis must be guarded. However, if it takes its most usual form, the prognosis is good.

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A Third Epidemic of Primary Virus Pneumonitis Among Infants in Minnesota

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THE epidemic character of primary virus pneumonitis of infants makes it of immediate interest to all concerned with the care of young infants. A third epidemic of the disease has just been observed in a group of newborn babies at the University of Minnesota hospitals. It appeared just four years after the last well-defined epidemic which occurred in February and March, 1941. This in turn occurred just four years fol-

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lowing the first recognized epidemic which was in January, February, and March, 1937. Following the original description of the disease¹ small epidemics were reported from various other localities during the early months of 1941. The apparent effectiveness of certain preventive and therapeutic measures makes its early recognition of considerable importance.

Briefly, primary virus pneumonitis is characterized by a high degree of contagiousness and by a predilection for

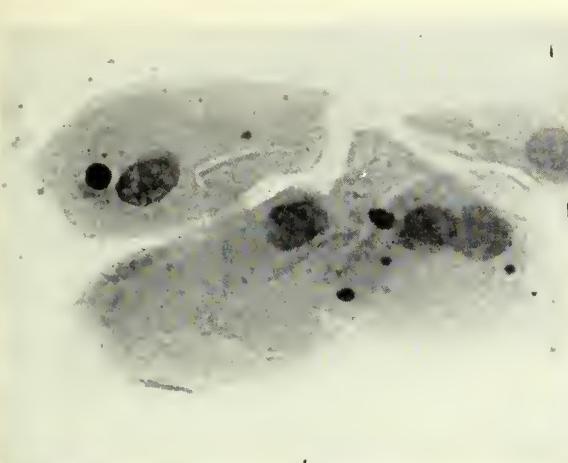


Fig. 1. A photomicrograph of a pharyngeal smear showing cytoplasmic inclusion bodies in epithelial cells. (Stain H. and E.)

very young infants. The earliest symptoms are sneezing and coughing. Attacks of cyanosis and dyspnea are common and may even be the first symptoms recognized. A thick white tenacious exudate in the throat is usually evident. The examination reveals fine rales over certain areas of the lung, the right upper lobe being the most common site. Roentgenograms of the chest reveal soft patchy shadows in the affected areas with accompanying signs of emphysema. The febrile response may be lacking or of low grade. A biphasic fever curve has been observed frequently.

The most significant diagnostic feature is the pharyngeal smear which shows cytoplasmic inclusion bodies in the epithelial cells.² In the present epidemic (Fig. 1) they have been found in large numbers in every case. Control patients in the same age group rarely have inclusions. As previously reported,^{1,2} the lungs from fatal cases have typical cytoplasmic inclusions in the bronchial, bronchiolar and alveolar epithelium. Necrosis and sloughing of bronchiolar epithelium and peribronchial infiltration of mononuclear cells characterize the micropathologic picture.

Epidemiological observations indicate that this disease is confined largely to the period of early infancy. The prematurely born infant is especially susceptible although he may be past the stage of immaturity. There is an apparent lack of neonatal immunity in these babies. In the first epidemic reported the mortality rate was 83.33 per cent in a group of 12 prematurely born infants. Older children and adults appear in the main to be immune to the agent responsible for the disease in infants. However, inclusion bodies are not infrequently found within the cytoplasm of epithelial cells in pharyngeal smears of older children and adults with mild respiratory infections.

For these latter reasons pooled adult serum has been employed therapeutically as well as prophylactically. In the 1941 epidemic pooled adult whole blood was given intramuscularly in a few cases, but the experience was insufficient for satisfactory evaluation of its effects. In a recent epidemic (1945) pooled human serum from ten

young adults was given subcutaneously in doses of 25 to 30 cc. to each of seven babies in the newborn nursery, all of whom showed signs of the disease at the time. Within twenty-four hours, amelioration of symptoms was apparent in all but one case. The same dose of serum was again given to this baby, following which improvement was evident. Amelioration of symptoms was so striking for the next five or six days as to suggest that the epidemic was controlled. However, exacerbations were again noted in three of the treated patients. One of these was found by the nurse to be very cyanotic and, despite all efforts, died within a few minutes. Additional pooled adult serum was given to the other affected infants with apparent benefit. Sudden, unexpected death due to pneumonia was observed in two instances in the previous epidemic. These have been reported elsewhere.³

In 1941, Dr. C. A. Aldrich⁴ reported that the cyanotic attacks of young infants apparently suffering from this infection were relieved by the use of adrenal cortical extract (cortin). We have used it with apparent benefit in several infants with pneumonitis. The recent reports of Dougherty and White^{5,6} demonstrating rapid increases in antibody titers in association with an increase in serum globulin and a marked reduction of lymphatic structures following the injection of cortical extracts, suggest the rationale for this form of therapy. As noted above, the cellular response, like that in other virus diseases, is largely mononuclear in type.

Oxygen, administered by means of a small tent, gives these patients with cyanosis definite relief, and is the treatment upon which we have to rely for the most severely ill infants.

SUMMARY

1. Within recent years three distinct epidemics of virus pneumonitis have occurred among young infants in Minnesota at intervals of four years (1937, 1941, and 1945).
2. The disease can be diagnosed readily from the characteristic symptoms and the finding of large numbers of cytoplasmic inclusion bodies within the epithelial cells in a stained pharyngeal smear.
3. Pooled adult serum has been found to have some prophylactic value. When used therapeutically in doses of 25 to 30 cc. it likewise appears to ameliorate the symptoms of the disease somewhat. Adrenal cortical extract may be helpful in treating these patients. Administration of oxygen is of paramount importance when cyanosis develops.

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Intratibial Infusions in Children

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AMETHOD for intratibial infusions in children has been recently described by H. I. Arteiter and A. J. Greengard.¹ It is the purpose of this paper to introduce a modification of the technic reported by these investigators. The modification described here simplifies the aforementioned method because of the use of a new needle.

MATERIALS

1. Schleicher² sternal aspiration needle with metal adaptor (Fig. 1 and 2).
2. Intravenous needle, 17 gauge.
3. Glass syringe, 20 cc. capacity.
4. Intravenous transfusion flask and tubing, preferably with a 2 cc. Luer syringe with a side connection.
5. A well-padded board with a heel support—the board preferably to be the length of the leg.

TECHNIC

The tibia has been chosen because of 1) its anatomical position, 2) the marrow cavity is large and permits a flow of fluid at almost any given rate, and 3) it is extremely difficult for the patient to disturb the needle because of the stabilization of the leg.

The leg is comfortably fixed to the board with a two-inch elastic bandage. The site chosen for the puncture is about 1½ to 2 cm. below the insertion of the tendon of the quadriceps muscle. This point and a large surrounding area is prepared with a routine antiseptic solution, and draped with sterile towels. It is important to observe sterile technic throughout this procedure. The area chosen for the puncture is then well infiltrated with 1 per cent novocaine. The periosteum must be well injected. The No. 17 intravenous needle is introduced into the skin at a 45° angle, and with a firm pressure and a twisting motion of the needle, an attempt is made to make a groove in the cortex of the bone. One may ascertain that this has been achieved by withdrawing the needle and looking for a spicule of bone in the point. One is now ready to introduce the Schleicher needle into the marrow cavity. The needle is adjusted to the desired depth and pushed through the skin puncture wound at a 45° angle, along the groove previously made in the bone. The needle is then straightened so that it is at right angles to the tibia. Then with a firm constant pressure and a twisting motion the needle is forced through the cortex into the bone marrow cavity. A characteristic "give" is felt as the needle passes through the cortex into the marrow cavity. To ascertain that the needle is in the cavity, the stilet is withdrawn and the tip examined for marrow tissue, which at the pediatric age range is red. If no marrow tissue is seen, the Schleicher needle is lengthened or shortened. This is done by holding the guard firmly against the skin and turning the head of

the needle in the desired direction. The 20 cc. syringe with the metal adaptor attached is now filled with normal saline and attached to the Schleicher needle. The saline is then forced into the cavity at a rate not faster than 5 cc. per minute; after approximately 10 cc. have been injected the saline is then aspirated. The fluid should

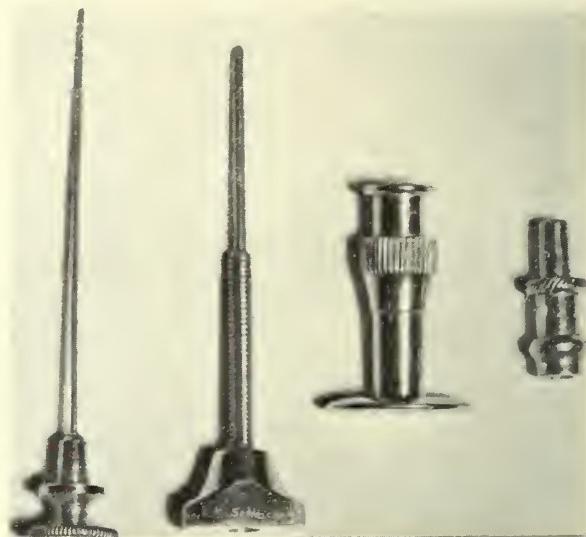


Fig. 1. Schleicher sternal aspiration needle with metal adaptor.



Fig. 2. Essential materials needed for these intratibial transfusions.

contain bone marrow. If the latter is not obtained on first aspiration, further injection of the saline may be necessary, followed immediately by aspiration. This injection and aspiration is done, for it is desirable to rupture some of the larger interosseous blood vessels, thereby insuring a rapid absorption of the fluid. When the saline can be injected into the cavity with relative ease, the syringe and adaptor are removed from the Schleicher needle and the Luer syringe is attached. Figure 3 shows the Schleicher needle in situ with the Luer syringe at-

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tached. It is recommended to begin the transfusion with normal saline flowing in at the rate of 45 drops per minute for the first hour as the minimum rate. Thereafter



Fig. 3. Schleicher needle in situ with Luer syringe attached.

the speed at which the fluid is to run in is based upon the desired fluid intake in twenty-four hours using 15 drops per minute as 1 cc. The flask should be elevated at least three feet above the level of the needle. Because the rate of flow decreases in about seventy-two hours, it may be necessary to elevate the flask up to the height of five feet above the level of the needle to insure the proper rate of flow. If the flow drops down to an undesirable speed, the Luer syringe is removed and the cavity irrigated with 20 to 30 cc. of saline, alternately injecting and aspirating. The Luer syringe is then reattached. It is imperative that the needle and the surrounding area are covered with sterile gauze.



Fig. 4. X-ray film of needle in situ.

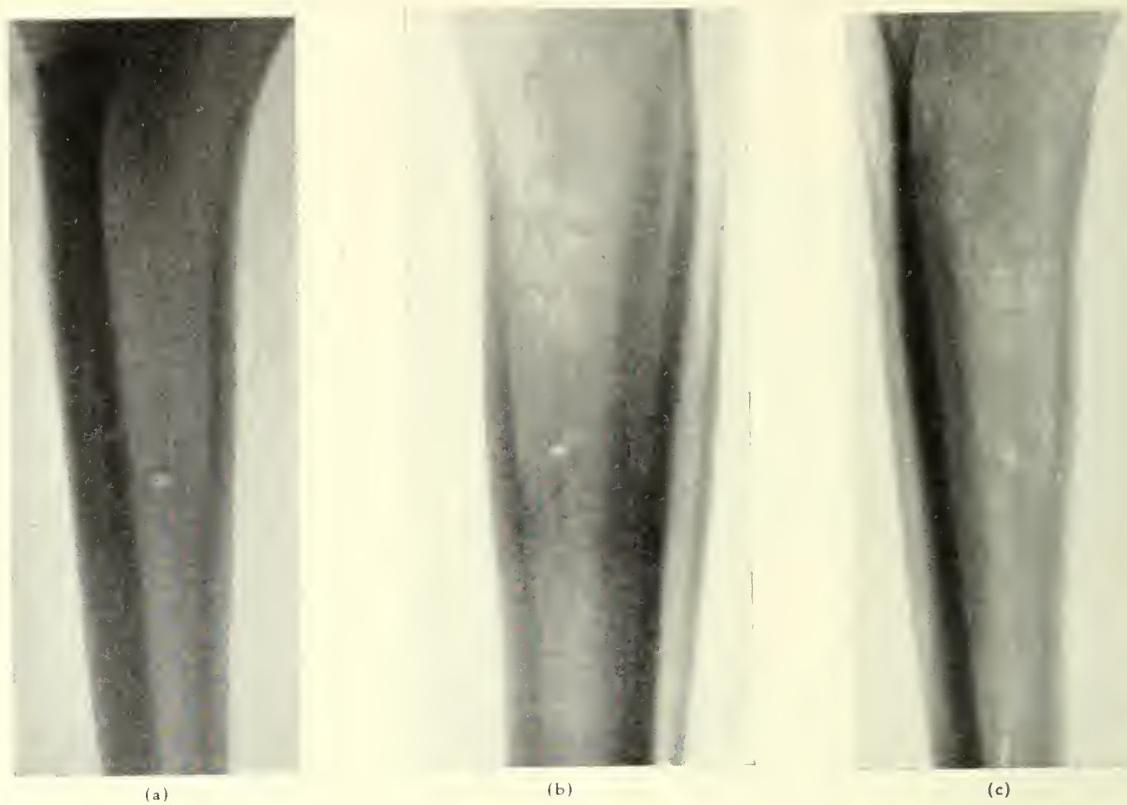
REMOVAL OF THE SCHLEICHER NEEDLE

To remove the needle, the guard is held firmly against the skin and the needle shortened by turning the needle head counter-clockwise. Do not pull needle out before the instrument can be moved to and fro with ease. This procedure will prevent injury to the cortex. The puncture wound is now covered with a sterile pressure dressing.

CASE REPORTS

Case 1. This type of infusion has been used at this hospital on a seven-year-old white male who developed generalized peritonitis following a perforated appendix. Conservative treatment of the case was instituted requiring the use of the Wangensteen nasal suction tube continuously for 32 days. During this time it was necessary to afford carbohydrates, proteins and vitamins by the parenteral route. The ordinary intravenous and subcutaneous routes were first instituted. At a later date, when it became obvious that continuous parenteral fluid was necessary, intratibial infusions were begun. The types of fluid given by this route were as follows: normal saline, 5 per cent glucose in normal saline, 10 per cent glucose in normal saline, 10 per cent Amigen, sodium sulfadiazine, human plasma, whole blood, and parenteral preparations of thiamin chloride, cevitamic acid, and nicotinic acid. The rate of flow of these fluids varied from 1 cc. per minute to 5 cc. per minute. This rate was varied throughout the entire procedure to meet the critical needs of the patient. The needle was first inserted into the left tibia where it remained undisturbed for six days. During this time, approximately 144 hours, 7,550 cc. of fluid was given. Then, because of the slow rate of flow, the needle was transferred to the right leg where it remained for two days when the needle was accidentally pulled out. Twelve hours later, the needle was re-inserted approximately 1½ cm. above the original site and remained in place in its new position for six more days. During this eight-day period, a total of 7,800 cc. was given. This makes a total of 15,350 cc. in fourteen days with an average of 1,100 cc. per day. It is felt that this daily intake may easily have been increased if the rate of flow had been accelerated. However, clinically this was an adequate fluid intake for this patient. It is well to note that after the reinsertion of the needle in the right tibia, there was no extravasation of fluid from the original puncture wound into the subcutaneous tissues, indicating the first puncture site had already sealed itself in twelve hours. During this entire procedure no undue discomfort was noted by the patient while administering the fluids at these various rates.

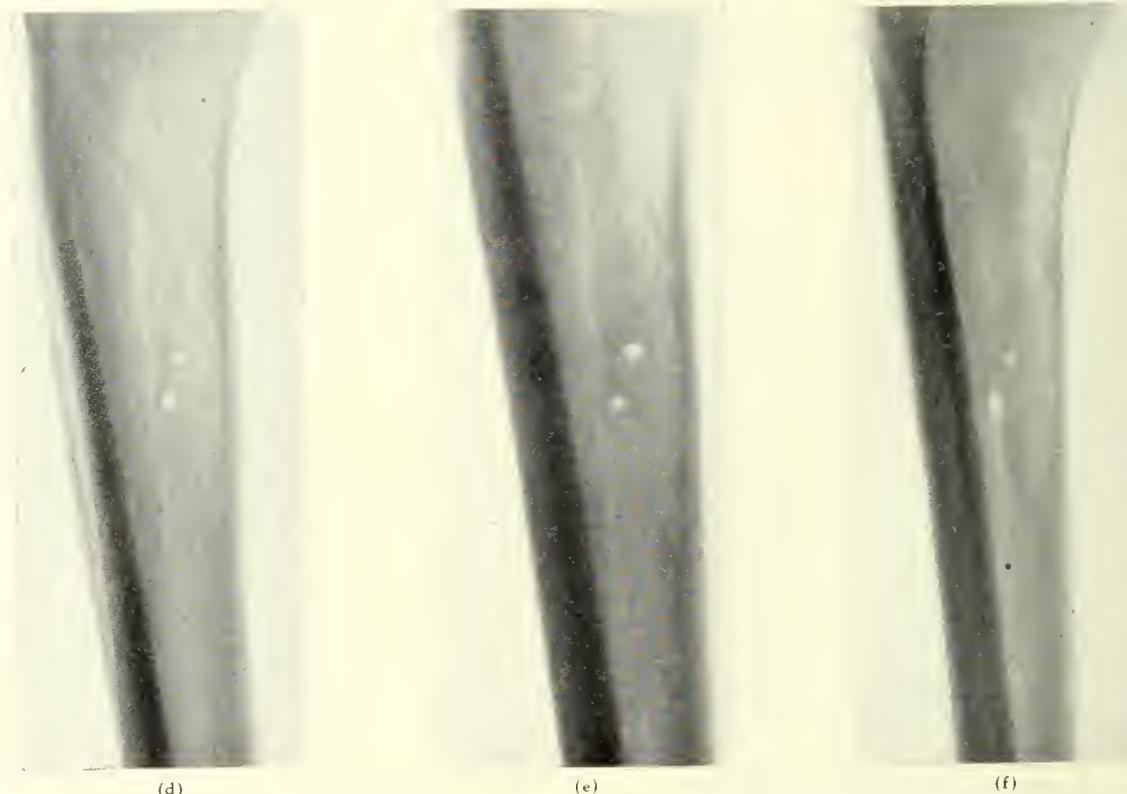
Case 2. The second case on which this type of infusion has been used was a three-year-old white female who entered the hospital with the diagnosis of ruptured appendix and generalized peritonitis. Continuous nasal suction was needed, and therefore parenteral fluids were indicated. A Schleicher needle was introduced into the right tibia at the site previously described. The following fluids were given: 5 per cent glucose in normal saline, plasma, penicillin, coramine, thiamine chloride, cevitamic acid and nicotinic acid. A total of 1,500 cc. of fluid was given in



(a)

(b)

(c)



(d)

(e)

(f)

Fig. 5. a) X-ray of the left tibia immediately after removal of the Schleicher needle. b) X-ray of left tibia six days after removal of needle. c) X-ray of left tibia two months after removal of needle. d) X-ray of right tibia immediately after removal of needle. e) X-ray of right tibia one week after removal of needle. f) X-ray of right tibia seven weeks after removal of needle.

a twenty-four-hour period. At the end of this time, the clinical course of the child permitted the removal of the needle. Here again, follow-up with x-ray revealed no evidence of osteomyelitis. The child made a successful recovery.

Case 3. This is the case of a three-year-old white male with the diagnosis of influenzal meningitis, type B. This child entered the hospital in a comatose condition, and therefore was unable to take food or fluids orally. Intravenous fluids were given for eleven days. After this time, it became impossible to continue intravenous fluids because of sclerosis of the vessels. A Schleicher needle was then introduced into the right tibia, and the following fluids were given: normal saline, influenzal antiserum, 10 per cent glucose in distilled water, 1 per cent sodium sulfadiazine, and parenteral preparations of thiamine chloride, cavitamic acid and nicotinic acid. In a forty-eight-hour period, a total of 2,840 cc. was given. The rate of flow varied 45 drops per minute to 18 drops per minute. The child expired forty-eight hours after the needle was introduced. Postmortem examination revealed no reaction at the site of the puncture wound.

Infusions may be given into both tibiae simultaneously, if the fluid intake need be higher than that that could be obtained by using one tibia alone.

FOLLOW-UP

A close check by means of x-ray showed that there are at the present time no signs of osteomyelitis at the sites of the puncture wounds. The holes produced by the

needle in the bones are healing over very well. Figure 4 shows x-ray film of the needle in situ. Figure 5 shows x-rays of the left and right tibia immediately after, one week after, and eight weeks after removal of the needle. A long range observation of these and other cases is planned and will be reported when informative data has been accumulated.

SUMMARY

The type of infusion described appears to be a desirable parenteral route for the administration of fluids in children. By this technic numerous reinsertions of the intravenous needle are avoided, thus sparing the patient undue discomfort. The fluid intake during twenty-four hours can be well controlled. Any type of fluid that can be given intravenously may be given by the interosseous route. The Schleicher needle is suitable for intratibial infusions and may be left in place for as long as seven days. No signs of osteomyelitis could be made out clinically and by x-ray examination.

It is our hope that this short communication will stimulate interest in this relatively new and simple type of infusion in children.

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We wish to thank Dr. E. M. Schleicher, Parke-Davis Fellow in clinical hematology, Minneapolis General Hospital, for his many helpful suggestions.

Rubella in Pregnancy and Congenital Malformations*

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THE etiology of congenital malformations has been sought eagerly for many years. Undoubtedly, the factors are multiple, in many instances as they have been shown to be in certain other disorders, for example, cancer. Few definite advances in our knowledge were made until recently. Both Hale^{1,2} and Warkany³ have shown, in pigs and mice respectively, that deficiency of vitamin A in the maternal diet at a critical period during pregnancy will produce congenital eye deformities in the offspring. Warkany has also shown⁴⁻⁷ that deficiency of riboflavin or vitamin D in the maternal diet will produce skeletal deformities in the fetus. That certain skeletal deformities in man are inherited has been demonstrated.⁸ It is also known that x-ray radiation of insects during the embryonic stages can produce deformities.⁹ Thus, it can be seen, that physical, nutritional, and genetic factors are concerned in the production of congenital malformations.

The purpose of the present report is to call wider attention to an additional example in which disease in the

mother is etiologically related to congenital defects in her offspring. Several well substantiated reports have appeared recently describing instances in which the mother has had a virus disease, German measles or rubella, during the first two months of pregnancy, usually between the fourth and eighth weeks, and the child has been born with certain congenital deformities. In 1941, Gregg,¹⁰ in Australia, reported a series of 78 cases of congenital cataract, 44 of whom also had congenital heart disease. These congenital defects occurred in infants whose mothers, with few exceptions, had had rubella during the early months of pregnancy. Swan and co-workers,¹¹ also in Australia, subsequently reported 49 cases of rubella occurring during pregnancy, 25 during the first two months. All of the latter group of women had infants with congenital defects usually of the heart or eye. Only 50 per cent of Swan's cases having German measles during the third month had infants with defects. Of those having the disease after the third month only 13 per cent had defects. In 1944 the same group of workers¹² added ten more cases to their series. In the same year two Americans, Reese¹³ and Erickson,¹⁴ reported three and

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eleven cases respectively. Thus 122 cases have been reported in which the mother has had rubella during pregnancy and the infant has been born with an anatomical defect. Usually the defects were of the eyes and heart, but the skull, auditory nerves, and brain were also affected in several cases. The eye defect described was usually a cataract in one or both eyes, and the heart defect was a patent interventricular septum or a patent ductus arteriosus. Since it is known that the lens of the eye and the interventricular septum develop between the fourth to the eighth fetal weeks of life¹⁵ and that the embryonic tissues are particularly susceptible to virus infections,¹⁶ it might have been anticipated that such deformities would occur. In fact, Swan and his associates reported that 100 per cent of the babies born of mothers who had rubella during the first two months of pregnancy had congenital deformities.

Since these reports have appeared, we have seen two such cases at the University of Minnesota hospitals. We feel that they should be reported in order to call further attention to the seriousness of pregnant mothers acquiring diseases, especially rubella, during the early months of pregnancy. Every attempt should be made to prevent exposure to such a disease. If exposure occurs in spite of precautions, such prophylactic measures as administration of pooled convalescent adult serum should be given a trial.

CASE REPORTS

Case 1. H. H., a five-week-old white female, was the first child of a 24-year-old female who was perfectly well throughout her pregnancy except for rubella which she had during the sixth to the seventh week. The rubella rash lasted two or three days and as the mother didn't feel sick she remained ambulatory. The pregnancy was carried to full term; the labor was sixteen hours in duration and no difficulty, no jaundice, no cyanosis, and no convulsions were present following delivery. The birth weight was six and one-half pounds, and breast feedings were started immediately. After two weeks, because she had failed to regain her birth weight, breast feedings were discontinued and an evaporated milk formula was started by the local doctor. Meanwhile, the baby had developed a thrush infection which persisted in spite of treatment until admission to the hospital. The cataracts were first noticed at two weeks of age at the time when the thrush infection was diagnosed; it was felt by the mother that the cataracts increased gradually in size after they were first observed. The baby continued to be a feeding problem and as the question of treatment of the cataracts arose, she was referred to the University hospitals. The family history was negative for congenital deformities.

Physical examination revealed a malnourished five-week-old female who weighed six pounds and eight ounces. The only abnormalities noted were of the eyes and the heart. Bilateral cataracts were present, the left being complete and the right, partial (lens was clear anteriorly). The heart was enlarged to the anterior axillary line in the fifth left interspace by percussion. A harsh systolic murmur was heard at the apex, transmitted over the entire precordium. The hemoglobin was 11.5 grams; the white blood cell count was 11,550 with 15 per cent polymorphonuclears, 79 per cent lymphocytes, 1 per cent monocytes, and 5 per cent eosinophiles. X-ray examination of the heart

confirmed the enlargement found on physical examination and also revealed enlargement in the region of the pulmonary conus. An electrocardiogram taken at this time was considered to be normal. The patient was given supportive treatment; she was offered a simple formula, and after several days of observation she was discharged to return at a later date for treatment of the cataracts. The heart defect was considered to be a patent interventricular septum.

Case 2. S. N., an eleven-month-old white female, was the fourth child of a 35-year-old female who was quite well during her pregnancy except for rubella which occurred during the fourth week. The pregnancy was carried to full term; the labor was normal and spontaneous delivery occurred. The baby weighed eight pounds and seemed normal except for a cataract of the left eye. No feeding problem existed in this case, but the motor and mental development was definitely retarded. At eleven months of age, the child still could not hold up her head nor sit up in spite of an adequate diet. Most of her movements seemed to be purposeless. The three siblings were living and well, and there was no family history of congenital deformities.

Physical examination revealed a well-nourished but underdeveloped eleven-month-old female who appeared grossly mentally deficient. She had many purposeless movements and sucked her fingers almost continuously. The head was 44 cm. in circumference, and the anterior fontanelle was very large (4½ x 5 cm.) for a child of her age. A complete cataract of the left eye was present; the right eye appeared normal. The heart seemed normal in size, but a loud systolic murmur could be heard over the entire precordium and through to the back, but best heard at the apex. The remainder of the physical examination was non-contributory. An electrocardiogram taken was interpreted as being borderline normal with suggestive peaked P₂ and increased Q₃ voltage. The hemoglobin was 12 gm. per cent; the white blood cell count 14,400 with 35 per cent polymorphonuclears, 63 per cent lymphocytes, and 4 per cent eosinophiles. X-rays of the heart were normal, but x-rays of the wrist suggested a beginning Madelung's deformity. This could not be stated definitely, however, because of the patient's age. The heart defect was interpreted as a patent interventricular septum.

SUMMARY

Attention is called to the occurrence of certain congenital anomalies in infants whose mothers suffered from rubella (German measles) between the fourth and the eighth weeks of gestation. Two new cases showing both congenital cataracts and congenital heart defects are reported. The importance of preventing rubella and other infections during the early months of pregnancy is pointed out.

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The Management of Rheumatic Fever

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IT has been stated that there are approximately 460,000 active cases of rheumatic fever in the country at the present time. It is my contention that these cases can be properly cared for only by the physicians of the United States.

Because of the complex nature of this disease—complex largely because of the chronicity and tendency to recurrence, and because of the fact that we are dealing with growing children—many ramifications in this matter have to be considered. We know that we must maintain proper environment for these children, that they must receive the best possible medical aid, and that their education must be maintained during the convalescent period of their illness. The magnitude of this problem, in my mind, places it beyond the scope of any agency, whether governmental or private. Pediatricians acting as consultants in their communities for the management of this disease, and situated strategically throughout the state, I feel can cover the case-finding and treatment of rheumatic fever better than any agency, no matter how well organized it may be.

It is becoming increasingly obvious that some aid must be given to the families of rheumatic children and to the physician who is trying to handle the cases. The disease is difficult to handle in the home because it is almost impossible to maintain the necessary discipline and proper bed rest for its duration. It may be in this field that governmental or social aid would be of greatest value. The various rheumatic fever programs which have been set up have proven their worth to the communities where they have been established. Most of them have worked on the basis that their function is to give a temporary lift to the situation, to assist the patient over the period of his acute illness and convalescence, and have then turned him back to his private physician. I feel that this is as it should be, and that there is no need for so complete a socialization of rheumatic fever cases that the private physician is eliminated from the picture.

Plans proposed whereby the case-finding was done by school nurses, county nurses, and social workers, without consultation with the family physician, are wrong. Close observation of school children by the nurse is, of course, necessary, and if the child seems ill he should be referred to his doctor. I do not feel that diagnosis lies in the realm of the nursing profession, and especially when such diagnosis leads to reference to a special clinic. Surely this is the realm of the family physician. If we as physicians have failed in meeting our obligations in guarding the health of our community, it is time we corrected this instead of turning this function over to lay groups. If

we have been lax in our recognition of rheumatic fever, we should inform ourselves of the multiplicity of this syndrome, and assume our responsibility as guardians of the health of our people.

Some plans for the management of rheumatic fever go so far as not only to care for the child during the attack, but to follow him continually until he has reached the arbitrary age of twenty-one. Such a plan may have merit in crowded city districts where the financial level of the patients is such that private medical care is out of the question. However in this broad land of ours where medical service is on the highest plane in the world, the nation-wide adoption of such a plan would be needless, prohibitively expensive and contrary to the best interests of the patient.

It is obvious, however, that governmental and social agencies have a definite role in the management of rheumatic fever. The patient is a child and, as a child, he is a growing being, who requires formal education and social training. During the acute stage of his illness he must have proper medical care. He must be made comfortable, fed properly, and receive the benefit of good nursing care whether he be in a home or hospital. His contact with his doctor must be such that at no time does he suffer neglect, or have any therapeutic measure neglected which might hasten his recovery or save his life. After this comes a period of months when he needs to adjust himself to his illness, maintain his sense of balance so that he does not develop an inferiority complex, and maintain his education so that he can return to normal life without the handicap of having lost out in school.

Here it is that agencies can help. They can provide for the hospital and convalescent care of these children so that the family will not be financially depleted. They should provide for a diagnostic clinic which can also be used as a follow-up clinic. These clinics should have ample physical space and facilities, to permit the referring physician to be present and discuss the diagnosis, treatment, and prognosis of the patient. The cooperation of the private physician should be further solicited through frequent visits to the hospital, where his suggestions and interests should always be encouraged. In this way, the family physician does not lose contact with his patient, while the diagnostic clinic and hospital service can be of great educational value to the medical profession. As soon as the patient has passed the infectious state, he should be turned back to the family and the family physician, where proper precautions can be taken to prevent a recurrence of the disease. The need for aid may arise again; but in the meantime attention and financial aid can be directed toward the continuance of the above program, and the patient-physician relationship will have been maintained.

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The Physician and the Child with Defective Speech

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THE physician, irrespective of his training or interest concerning speech problems, is the one person to whom most parents logically turn for counsel when one of their children manifests a defect in speech. Because he has not been offered training in the special methods of speech rehabilitation, he is prone to regard disturbances of speech as falling outside of his field of responsibility. Consequently it is important that the physician acquaint himself with the various factors concerned in the etiology of delayed or abnormal speech development in order that he may direct such patients to scientifically trained speech clinicians.

As a preface to the discussion of abnormal speech it is desirable to define normal speech development for comparison. The sequence of speech development in the normal child may be described in the following way. The birth cry is reflex vocalization which by two to three weeks has become a crude vocabulary in that adults caring for the infant can to a certain extent distinguish cries due to such factors as hunger, cold or pain. At the sixth or seventh week the babbling period appears. It seems to remain essentially reflexive in character and is commonly referred to as cooing and gurgling. Lalling starts at the early part of the second six-month period. During this stage hearing and sound production become associated by the infant and repetition of heard sounds begins. The congenitally deaf child may repeat sounds during this period but he does so from internal stimuli or for oral pleasure. At nine to ten months the echolalia period begins. The child's repertoire of sounds and sound combinations gradually becomes confined to those occurring in language of his environment. At the age of twelve to eighteen months most children are beginning to use speech as adults do. That is, they intentionally use conventionalized sound patterns to manipulate their environment. This usually involves the use of single words from twelve to eighteen months. Later, at two to two and a half years, two or more words are coupled in simple sentences. By the eighth year of life most children articulate correctly all the sounds of our language.

The four factors to be taken into account in the diagnosis of delayed speech development are: 1) the child's entire developmental rate in non-speech motor areas, 2) his intellectual level, 3) the status of his hearing apparatus insofar as its use can be measured, and 4) his need for speech usage. The physician is often not aware of the importance of these items in relation to speech development.

When it is appreciated that speech is the most highly complex motor skill the human organism performs, the necessity to evaluate the level of more gross motor developments becomes obvious. In the pediatric outpatient

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department at the University of Minnesota hospital motor coordinations are carefully tested and a thorough developmental history is obtained from the parent or other informed adult. Later the speech clinician interviews the parent for questioning concerning motor development. In this way we are furnished with a test of the consistency of parental response. As it is well known that parents are often unable to recall accurately the dates of first step, eye-hand coordination, grasping, and so forth, and that there is an almost universal tendency to seek some easy explanation for any negatively evaluated trait, the questions asked should be cautiously and non-directively phrased. We do not suggest, therefore, "And did Johnny walk at the same age your other kids did?" Instead we ask, "Do you remember how old Johnny was when he took his first step?" Furthermore, one should not compare a child's gross motor development to that of other children of the same chronological age without comparing the individual child's motor coordination to his own other growth rates.

The second factor to be considered is referred to by that much-abused term "intelligence". The greatest number of problems of delayed speech are not referred to the physician until the child is of school age, when his handicap becomes more acutely one of socio-educational importance. The absence or delay of speech development is indicative to many parents of inferior intellectual capacity. It is important to bear in mind that when a child lacks the use of language any estimate of his intellectual level is limited to observation of other types of performance. The child without speech cannot be measured by the yardstick used to measure his age mates. Half or more of the conventional measure is missing. It is essential, therefore, that tests of language comprehension, ability to follow directions, manipulation of objects, and so forth, be given and interpreted by an expert in psychological testing.

The difficulty of separating the third factor, hearing, from intelligence for independent measurement is tremendous. The child's responses to tests employed in measuring intelligence must be qualified by his hearing ability. Because there is no standardized, valid means of using the audiometer to test the hearing of children below the third grade level, the task is further complicated. It is possible to calculate crudely the hearing acuity of the young non-speaking child by using pictures of animals or miniature animal objects in conjunction with the audiometer. Because the young child fatigues readily in the test situation only frequencies of 512, 1024, and 2048 are used.

The fourth and least clear-cut, yet important, factor in delayed speech development is the child's need for language usage. Frequently a child whose general motor coordination is poor is over-stimulated in speech areas by his parents. There is often overwhelming pressure for

verbal responses and his inability to coordinate generally is thoroughly ignored in its relation to speech development. Again parents may frequently stimulate the child to speech in a situation where there is no need for speech. Language usage does not develop unless the child discovers that he may through the use of verbal symbols satisfy needs and desires which cannot be satisfied in any other way. Too many children have learned to speak in spite of their parents, rather than because of them.

As stated earlier, the physician is usually the first person to be consulted regarding children with delayed speech. He may refer the child to a competent otologist, who, if he finds a hearing loss, may prescribe a hearing aid. However, the need for speech training, lip reading, or other therapeutic measures exists for many of these patients. There is little that can be done to change mental retardation in most cases. In the child whose motor coordination is poor speech improvement can be effected to a limited extent by use of physiotherapy which improves his general coordination. Improvement is more likely with the added use of speech drills which the speech clinician is qualified to employ in a fashion that will sustain the interest of a young child. The fourth factor, interference with the need for speech usage, is the one which can be most successfully eliminated through counselling and work with the child and his parents. While the physician does not have the special

training or the time to manage the latter aspect of the problem he has the responsibility of recognizing such disturbances and of referring these cases to qualified speech clinicians for detailed analysis and treatment. It should be pointed out that in individual cases various other factors may operate to cause delay of speech development. The four factors mentioned are, however, the most frequent and the most specific in producing this condition.

A discouragingly large number of parents bring children to the speech clinic after delaying for one to five years because they had been assured that the child would "outgrow" his speech retardation. In too many cases such assurance has been given by the physician. Unfortunately qualified speech pathologists are comparatively few in number and most of them are located in the larger cities. This lack of properly trained personnel is a serious deficiency, correction of which will require cooperation of physicians who recognize its significance and educational institutions offering special training in this field. It is a serious mistake to tell parents that their child will outgrow his defect even if there is no speech pathologist immediately available to whom the case could be referred. A physician in an outlying district far from a plastic surgeon would certainly not tell parents of a baby with a cleft palate that their child would outgrow his defect because the necessary help was not at hand. Nor should he give parents soothing but misleading assurance in the case of speech problems. It is only by complete cooperation and understanding between physician and speech clinician that the speech problems of thousands of children can be met. Development of adequate service in this important area should be recognized as an essential feature of any comprehensive child health program.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS FEBRUARY 16, 1945

Name	School	Address
Bayrd, Edwin Dorrance	Harvard U., M.D. 1942	Mayo Clinic, Rochester, Minn.
Bryan, Allen Lindley	Temple U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Chesley, George L.	Northwestern U., M.B.'43, M.D.'43	Mayo Clinic, Rochester, Minn.
Dean, Roscoe Elmer, Jr.	Temple U., M.D. 1943	Ancker Hospital, St. Paul, Minn.
Drumheller, John Franklin	Temple U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Estes, John Earle, Jr.	U. of Illinois, M.D. 1943	Mayo Clinic, Rochester, Minn.
Gastineau, Clifford Felix	Oklahoma U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Guthrie, Robert	U. of Minn., M.B. 1944	924 S. E. Essex, Minneapolis 14, Minn.
Holyoke, John Bartlett	U. of Neb., M.D. 1940	Mayo Clinic, Rochester, Minn.
Hosfeld, Sara Marjorie	Johns Hopkins, M.D. 1943	Mayo Clinic, Rochester, Minn.
Johnson, Charles Clifford	St. Louis U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Kniseley, Ralph Marion	U. of Pittsburgh, M.D. 1943	Mayo Clinic, Rochester, Minn.
Lightfoot, Grace Kathryn	U. of Wis., M.D. 1942	Mayo Clinic, Rochester, Minn.
McVicker, John Hugh	U. of Colo., M.D. 1943	Mayo Clinic, Rochester, Minn.
Masson, James Knowles	U. of Rochester, M.D. 1943	Mayo Clinic, Rochester, Minn.
Morton, Robert James	U. of Kansas, M.D. 1943	Mayo Clinic, Rochester, Minn.
Nickeson, Robert Warren	U. of Pittsburgh, M.D. 1943	Mayo Clinic, Rochester, Minn.
Stokes, Gordon Dudley	Northwestern U., M.B.'43, M.D.'43	Mayo Clinic, Rochester, Minn.
Strong, George Henry	Johns Hopkins, M.D. 1939	Ancker Hospital, St. Paul, Minn.
Werner, Robert Frederic	U. of Minn., M.D. 1927	1370 Spruce Place, Minneapolis 4, Minn.
Williams, Bruce Foch Pershing	Columbia U. P. & S., M.D. 1943	St. Mary's Hospital, Minneapolis 6, Minn.
Wilson, Benjamin Norman	Baylor U., M.D., 1942	Mayo Clinic, Rochester, Minn.
BY RECIPROCITY		
Boyles, Joe Merritt	Wash. U., M.D. 1930	417 E. First St., Maryville, Mo.
Dahlstet, John Paul	U. of Neb., M.D. 1943	123 Summit Ave., St. Paul 2, Minn.
Fisher, Russell Lynn	U. of So. Cal., M.D. 1944	Mayo Clinic, Rochester, Minn.
McQuarrie, Harlow Brooks	Geo. Wash. U., M.D. 1941	Mayo Clinic, Rochester, Minn.
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NATIONAL BOARD CREDENTIALS		
Dickson, James Allen, Jr.	U. of Pa., M.D. 1941	Mayo Clinic, Rochester, Minn.
Hopps, Emerson Eli	Geo. Wash. U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Johnstone, William Wandell	Northwestern U., M.B.'43, M.D.'44	Oak Hills, Bemidji, Minn.
Osborn, John Ernest	U. of Buffalo, M.D. 1943	Mayo Clinic, Rochester, Minn.
Tucker, Margaret Emmeline	U. of Chicago & Rush Medical College, M.D. 1934	Dept. of Radiology, U. of Minn., Mpls. 14, Minn.
Wagner, Norman W.	U. of Iowa, M.D. 1940	207 E. 4th St., Morris, Minn.

American Student Health Association News-Letter and Digest of Medical News

OLIVER E. BYRD, Ed.D.
Associate Professor of Hygiene

FOOD VALUE OF OLEOMARGARINE

The Council on Foods and Nutrition of the American Medical Association reports that the first commercial production of margarine was by the Frenchman Meges-Mouries in Paris in 1870, who had earlier developed the product. The French government had assigned to him experimental work with fats as part of the effort to produce a cheaper product which would serve in place of butter. The early product was made principally with oleo oil, but soon neutral lard and vegetable oils were used.

In 1933 more than 75 per cent of the oil used in margarine was imported coconut oil. During that year the use of soybean oil was negligible, and only 9 per cent of cottonseed oil was used. In 1942 the use of coconut oil had dropped to 1 per cent, and none was used during 1943. In the latter year 90 per cent of the oil used in margarine consisted of cottonseed (50.4 per cent) and soybean (39.6 per cent) oils.

The early deficiency of vitamin A in margarine has been corrected, primarily because of the application of the full force and influence of nutritionists throughout the country on the problem. The beginning of the widespread use of vitamin A in margarine dates from the authorization of its use in margarine manufactured in plants under Federal Meat Inspection in February 1941 and adoption of the Definition and Standard of Identity for Oleomargarine in June 1941. It is estimated that 85 per cent of the margarine was fortified by vitamin A during 1942. This increased to over 90 per cent in 1943, and reports indicate that now more than 99 per cent of the margarine sold to civilians contains not less than 9,000 U.S.P. units of vitamin A per pound. All of the nearly 90 million pounds purchased by federal agencies in 1943 was required to be so fortified. A small percentage of the total production classed by industry as "industrial sales" and sold to bakers and other establishments is unfortified.

The Council reaffirms its confidence in the nutritional value of margarine containing vitamin A as follows:

1. Margarine contributes primarily fat to the diet.
2. The fat is equal in digestibility and caloric value to other food fats.
3. The standardized vitamin A content of fortified margarine was so set that it contributes this nutritional factor in amount equivalent to average butter in accordance with information available at that time. (Recent surveys indicate a higher average value for butter.)
4. The milk solids other than fat (1 per cent) present in both butter and margarine are of negligible nutritional importance.
5. When margarine is fortified with vitamin A the investigations that have been made lead to the conclusion that it can be substituted for butter in the ordinary diet without any nutritional disadvantage.

Reference. American Medical Association. "Margarine fortified with vitamin A." *Journal of the American Medical Association* 126:168 (No. 3) Sept. 16, 1944.

DISINFECTION OF AIR BY VAPORS AND MISTS

O. H. Robertson of the American Public Health Association's Committee on Germicides and Antibacterial Agents reports that recent developments in the field of air sterilization with glycol vapors have shown that triethylene glycol is the most potent agent yet found. This substance is highly lethal in concentrations of 1 gm. of the glycol dispersed in 200 million ml. or more of air for the respiratory pathogens and influenza virus. Tests on triethylene glycol consisting of maintaining monkeys and rats for many months to a year in an atmosphere saturated with this substance have revealed no damaging effects. Likewise the long continued ingestion of this substance has had no detectable harmful action.

Investigation of the various conditions which affect the germicidal activity of glycol vapors has shown that atmospheric humidity is of marked importance; a minimum of 35 per cent relative humidity being essential for the killing of dust-borne bacteria. Practical application of the use of glycol vapors for the purpose of controlling airborne infection has had to await the construction of suitable apparatus for the dispersion of glycol vapors into large enclosed spaces and the development of an instrument to control automatically the concentration of glycol vapor in the air. Rapid progress is being made in the solution of both these problems. Reports of the use of propylene glycol vapor in a children's hospital suggest that it was effective in reducing the incidence of acute respiratory infections.

Reference. Robertson, O. H.: "Disinfection of air by germicidal vapors and mists." *American Journal of Public Health* 34:886-87 (No. 8) August 1944.

TUBERCULOSIS IN THE ARMY

Colonel E. R. Long of the Surgeon General's office reports that the incidence of tuberculosis is only one-tenth as high in the Army as it was in the last war. The principal factor in the decrease is the screening process which excludes men with active or potentially active tuberculosis before they are inducted. Another reason is that among civilians tuberculosis is only one-third as prevalent now as it was in the first world war.

Technical equipment had not been developed for quick and accurate detection of this disease in the last war. By means of x-ray photography tuberculous cases now can be excluded with great accuracy. This screening process came to be used universally in the army in the spring of 1942. Nearly one million men were inducted without this x-ray examination, which to a large degree accounts for the 10,500 men discharged from the army because of tuberculosis between December 1941 and December 1944.

Since the beginning of the present war, the army has rejected about 150,000 men who showed signs of pulmonary tuberculosis. Several thousand others were excluded by local boards of the Selective Service system before they reached induction centers. The x-ray photographs of all men inducted in the army are kept on file. X-rays

are always taken also when army personnel are discharged. The rate of discharge is low for young inductees. The tuberculosis rate for men over 40 is eight times as high as for those under 20 years of age. The rate overseas is lower than in the homeland, largely because those who have this disease were weeded out before being sent to a combat theater.

The army's system of handling these cases represents an outstanding contribution to the national program.

The tuberculosis control program of the armed forces has attracted the attention of the military and public health services of foreign countries, delegations from several of which have come to this country to observe the program.

Reference. Long, E. R.: "Tuberculosis in the army," Bulletin of the U. S. Army Medical Department 11 (No. 85) February 1945.

THE INHERITANCE OF BIRTHMARKS

Sarah J. Denaro of Radcliffe College reports on a study of four families which substantiates other investigations showing birthmarks to be inherited.

There are a great many superstitions concerning the presence of birthmarks, but there is now considerable evidence to show that they are inherited.

In one of the families of this study two large brown nevi (birthmarks) were inherited from grandmother to two daughters, to granddaughter in the same place—on the left side of the body at the level of the waist.

In another family two daughters were found exhibiting a nevus on the chin in the exact position in which it appears on the chin of the father.

In a third family the same type and size of birthmark was inherited on the face by two members and on the back by three other members.

In a fourth family six members showed the same type of nevus on the face, while six others showed a similar nevus elsewhere on the body.

The tendency for members of a family to inherit a birthmark in the same position is not universal, but studies of pedigrees show that the frequency of such localization is very high.

Reference. Denaro, Sarah J.: "The inheritance of nevi," Journal of Heredity 35:215-18 (No. 7) July 1944.

Book Reviews

Year Book of General Therapeutics, 1944, edited by OSCAR W. BETHEA, Ph.M., M.D., F.A.C.P. Chicago: The Year Book Publishers, Inc., 447 pages including indexes, 1945, price \$3.00.

Hundreds of busy doctors have learned to watch for the useful handbooks published annually by the Practical Medical Series of Year Books founded in 1900. The year 1944 saw such rapid development in the use of drugs and technics that this new manual of treatment is of even greater interest and value than usual. A glance at the "jacket-quiz" is likely to abash the average doctor and to cause him to realize how vague is much of his knowledge of some of the most recent work of his colleagues.

In the present volume the sulfonamides hold first place in point of interest. Penicillin comes next with 62 pages devoted to its miracles and to the attending antibacterial substances patulin and penatin. The new methods of administering anesthetics, of transfusions and infusions are given careful attention; new mechanical devices and tests are described and illustrated. The vast amount of reading that has gone into the making of the book has been digested and organized in excellent fashion for speedy reference. The index to authors is an admirable feature.

In short this book lives up fully to the reputation established by previous manuals in the series and high praise is due the editor.

Arterial Hypertension, its Diagnosis and Treatment, by IRVINE H. PAGE, M.D., and ARTHUR CURTIS CORCORAN, M.D. Chicago: The Year Book Publishers, Inc., 344 pages including appendix, index, bibliography; 1945, price \$3.75.

Hypertension is the greatest peace-time killer in the western world. Yet its origin and causes remain a mystery, its treatment hardly more than a hopeful gesture and only the relatively few seem unduly concerned about it. In their admirable little book Doctors Page and Corcoran of the research division of the Cleveland Clinic Foundation, have classified, organized

and summarized the significant high spots in our knowledge to date of this disease against a background of relevant information essential to their understanding—facts of the changes as the disease progresses in the anatomy and physiology of the circulatory system, the kidneys, the brain. The diagnostic tests at various stages are described as are the approved treatments,—drugs, vitamin A, psychotherapy and surgery,—with enough of the theories on which each is based.

The authors see the problem of essential hypertension "as a pattern of fluid Becoming rather than static Being, as a stream which, according to the nature of the watercourse, flows swiftly or slowly, darts through canyons or expands into still lagoons." In their diagnosis, prognosis and treatment, therefore, their focus is on the patient as a whole person rather than on the particular symptoms whereby he deviates from the normal.

In their introduction they state that their intention has been to produce a useful manual; that it is "presented for those whose special interests do not lie exclusively in this field." Such readers will not doubt the success of their achievement. In its conciseness, comprehensiveness and clarity it is a model of medical exposition for the medical student and the busy practitioner.

You Must Relax: a Practical Method of Reducing the Strains of Modern Living, by EDMUND JACOBSON, M.D. Published by arrangement with The University of Chicago Press, printed in the United States of America by the Maple Press Co., York, Pa. 261 pages, 29 illustrations, 1943 revised edition; price \$1.75.

This is truly a vademecum for the nervous individual, and physicians will do well to prescribe it for their patients who are overworked and unduly worried. If they can be taught to relax without the use of sedative capsules, then a constructive program has been instituted. It is one of those books that, after once having been read from cover to cover, may be picked up from time to time with great benefit when the original training is losing some of its impressiveness.

The illustrations are very beneficial in clarifying the teachings in the text. The jacket with subgroupings of when, why and how to relax is sure to intrigue the busiest reader to look inside.

The revised edition deals with new developments and contains three new chapters—one on war nerves, one on sleep, and the chapter on blood pressure has been completely rewritten.

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MINNEAPOLIS, MINNESOTA, MAY, 1945

THE ETIOLOGY OF CONGENITAL MALFORMATIONS

In this day of enormously accelerated scientific progress we have become so inured to hearing of epoch-making new discoveries that disclosure of any achievement less spectacular than radar, the electron microscope, D.D.T., sulfa-drugs or penicillin is likely to go unnoticed by most of us not working in the particular field concerned. This appears to have been the fate of certain significant reports pertaining to the causation of congenital malformations. One of the shorter papers in our present issue (page 197) calls attention to the serious consequences that may result to the offspring from certain mild infections in pregnant women. Reports concerning the experimental production of congenital defects in lower animals by dietary restrictions during the period of gestation are of similar significance.

Congenital anomalies were long regarded by physicians as atavistic "freaks of nature" or "throw-backs" with their pathogenesis so obscure that mortal man could never hope to divine its true nature. However, an imposing

array of evidence is now available to prove the erroneousness of this assumption.

More than three decades ago Hertwig and others demonstrated that certain deviations from normal structural development could be produced in early amphibian embryos by exposure to radiant energy. As early as 1921 a group of experimental nutritionists in England (Zilva, Golding, Drummond and Coward) observed that young pigs were not infrequently born with some of their limbs missing when sows were deprived of certain vitamins throughout pregnancy. Twelve years later Hale described pigs born with anophthalmos, cleft palate, misplaced kidneys and accessory ears as a result of their mothers being fed a vitamin A deficient diet. Warkany and Schrafenberger have more recently obtained similar results in rats by excluding vitamin A from the maternal diet.

These latter workers and Nelson earlier induced congenital malformations of the skeleton in about one third of the young of female rats that were reared on a diet deficient in riboflavin. Malformations of this type in the rat could be prevented by riboflavin if given as late as

the thirteenth day of gestation. Thereafter, however, it was found to be ineffective because in the rat the fourteenth and fifteenth days correspond with the most critical stage in the development of the cartilagenous and osseous skeleton from undifferentiated mesenchymal structures. An entirely different pattern of skeletal malformations was produced in the offspring when the diet of pregnant rats was made deficient in vitamin D.

Whether a similar relationship between maternal diet and congenital anomalies applies in the case of man is not known. Nevertheless, it should be kept in mind as a possibility when diets are being prescribed for pregnant women. The clinical evidence presented in support of the claim that congenital malformations such as cataracts and certain cardiac anomalies result from the occurrence of rubella in the mother at a critical period during pregnancy appears to be almost incontrovertible. It naturally follows from this observation that every effort possible should be made to protect the pregnant woman against all forms of acute infection.

I. McQ.

FEDERAL-STATE PROGRAMS FOR CHILD HEALTH AND MEDICAL CARE

Five permanent federal-state programs are now in effect which contribute to or specifically provide for child health services and medical care. These programs provide grants-in-aid of federal funds for governmental services which involve state cooperation in their administration. All but one of these programs require matching of federal funds by state and local funds. Under the supervision of the Children's bureau, United States department of labor, these programs make provision for maternal and child health services, services to crippled children, and emergency maternity and infant care for the wives and infants of men in the four lower pay grades of military service. General public health work and venereal disease control are provided under the United States public health service. A total of approximately \$70,000,000 is appropriated annually by the Congress for these services.

In spite of this rather impressive provision for child health care there is at present considerable activity to complete arrangements for the improvement of public health services. Both public and private organizations and agencies are active. Only a few months ago the Congress inaugurated a program for which a maximum of \$10,000,000 per year was authorized for grants-in-aid to states for the establishment of nation-wide control of tuberculosis under the supervision of the United States public health service. Presently the Congress is seriously considering the passage of a hospital construction act which, during the first year of its operation, proposes to make available \$110,000,000 to the states for surveys of hospital facilities and construction in accordance with needs that may be demonstrated. There is also a proposal for a federal-state financed program of dental health service and care.

An outstanding proposal for administration of public health services has recently originated in the American Medical Association.¹ On June 10, 1942, the House of Delegates of the association passed a resolution recom-

mending the establishment of full-time qualified local health departments in every community of the country. The American Public Health Association approved this recommendation in October, 1942, and established the basic plans for the development of these local health departments.² It is significant that this proposal is supported by the two great medical organizations of this country. In the field of specific services for children the American Academy of Pediatrics at the national meeting in November, 1944, developed a set of principles for a postwar program of complete child health services and medical care.³ One month earlier, an official of the children's bureau, in discussing the EMIC (emergency maternity and infant care) program and postwar planning for child health, suggested a plan of federal action for the further development of child health services.⁴ Multiplicity of proposed programs indicates the number and variety of problems that need to be met.

What will be the eventual pattern of organization and administration of these services? In the last two years the EMIC program has given rise to much discussion and speculation by the medical profession. It is certain that this, the EMIC program, will not be the prototype of future child health services. The EMIC program is financed entirely and is controlled by the federal government and involves state cooperation only for its administration. Moreover, the EMIC program is designed to meet the immediate needs caused by the war. We do not expect to find in such a program the pattern for permanent operation which must fulfill the varying needs of all communities in this country. Undoubtedly, the future pattern for child health services will be a combination of the many proposals, a few of the more outstanding of which have been mentioned.

There appears to be little doubt that the plan of federal-state financing is here to stay. Federal financing has been established with the idea of making equitable distribution and coordination on the basis of local economic need and resources. Federal advice and planning have been used to stimulate a reasonable nation-wide coordination and uniformity of development. The local full-time qualified health departments as recommended by the medical associations are basic in any public health program and are greatly needed to permit local participation which is essential to the planning and administration of individual community needs. The cooperation and planning, financing and administration will probably prove to be federal, state and local. Certainly the future development of health programs for children is worthy of the careful thought and consideration of every physician and citizen if an intelligent coordinated and economic overall program is to be assured.

ROGER L. J. KENNEDY, M.D.

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. . . MEET OUR CONTRIBUTORS . . .

Dr. Irvine McQuarrie (Minneapolis), our guest editor, is as everybody knows, Chief of the pediatrics department of the University of Minnesota. A graduate of Johns Hopkins medical school in 1921, he came to Minneapolis fifteen years ago and ever since has spread his gospel far beyond the confines of Minnesota through disciples he has trained and inspired here, many of whom are now themselves heads of departments in medical schools throughout the land. (Represented in this issue are students of his now at Tulane, Texas and McHarry medical schools). But Dr. McQuarrie is a man of parts whose interests extend far beyond children. Editor-in-chief of Brennemann's *Practice of Pediatrics*, and one of the *JOURNAL-LANCET*'s own editorial staff, he is also the author of *Experiments of Nature and the Advancement of Medical Knowledge*; member and contributor to many research societies whose interests vary from biology to epilepsy, he has recently been elected president of the Minnesota branch of the American-Soviet Medical association. The list of pediatrics societies to which he belongs includes even Mexico's while the American College of Dentists claims him as an honorary member.

Dr. Roger L. J. Kennedy (Mayo Clinic, Rochester, Minnesota) is interested primarily in children's diseases, but mothers form an important background in his conception of his job, as is indicated in his editorial. After graduating in 1922 from Minnesota's medical school, he took his postgraduate work at the Mayo Foundation and was a fellow there in pediatrics the following year. Since 1933 he has been associate professor of pediatrics at the Mayos. He is also interested in parks and from 1930 until 1940 he served Rochester as park commissioner. A member of many medical and pediatrics societies he likewise belongs to the fraternities Alpha Omega Alpha, and Sigma Xi.

Dr. Arild E. Hansen (Galveston, Texas) since leaving here has added much to the prestige of pediatrics in Texas and to the fame of Dr. McQuarrie's department. Receiving his M.D. at Minnesota in 1924, he continued his training at the universities of Heidelberg and Vienna and at Yale. In 1934 the University of Minnesota awarded him his Ph.D. Dr. Hansen is not only Professor and Chairman of Texas University's pediatrics department but he is also the Director of its Child Health Program. His society memberships include the American Pediatric Society, the Society for Pediatric Research, and the American Institute of Nutrition.

Dr. Reynold A. Jensen (Minneapolis) is now associate professor of pediatrics and psychiatry at the University of Minnesota hospital. Graduating from Minnesota's medical school in 1935 he decided to make psychiatry his specialty and to that end accepted a resident position at the University of Rochester hospital after which he held a fellowship in psychiatry at the Institute of Penn hospital, and followed this up with an instructorship in pediatrics and psychiatry in Boston. In 1939 he returned to the University hospital in Minneapolis and is now associate professor of pediatrics and psychology in that institution. In addition to membership in various medical and pediatrics societies he is a member of the American Association for Research and Psychosomatic Medicine of the American Association for the Advancement of Science.

Dr. Alvin D. Wert (Richland, Washington) is one of the young pediatricians trained by Dr. McQuarrie. A graduate of the University of Rochester, he came to Minnesota in 1942 and spent two years studying pediatrics. He is now practicing his specialty on the west coast.

Dr. J. T. Cohen (Minneapolis) is a well-known dentist whose prime interest is in better teeth for children. He was graduated at Minnesota's College of Dentistry in 1916 and is now assistant clinical professor in the University's pediatrics department. He has done considerable research in his special field and is a member of the International Association of Dentistry for Children.

Dr. N. Logan Leven (St. Paul), clinical associate professor of surgery at the University of Minnesota, received his advanced degrees from the Mayo Foundation after graduating from Minnesota's medical school in 1928. He is an F.A.C.S., a diplomate of the American Board of Surgery and a member of the American Association for Thoracic Surgery.

Dr. Bernard C. Lannin (Minneapolis) has followed closely the lead of Dr. Leven. After receiving his medical degree in 1937, he too won the degrees of M.S. and Ph.D. at the Mayo Foundation and he too is a diplomate of the American Board of Surgery. At present he is an instructor in the department of surgery at the University of Minnesota.

Dr. E. Perry Crump (Nashville, Tenn.) was graduated from McHarry medical college of Nashville in 1941. He is another who received his pediatrics training from Dr. McQuarrie and is now on the teaching staff of his alma mater.

Dr. Theta H. Wolf (St. Paul) is a doctor not of medicine but of philosophy, now associated with Minnesota's University hospital. After taking her master's degree at Brown University she came to Minnesota for her doctorate and specialized in clinical psychology and pediatric psychiatry. She has taught at Skidmore College, Saratoga Springs, N. Y., and at Christian College, Columbus, Missouri.

Dr. R. V. Platou (New Orleans) is the head of the department of pediatrics at Tulane University. He received his M.D. and M.S. degrees from the University of Minnesota and continued his training in pediatrics at the University hospital and at the Babies hospital in New York City. He is a member of the American Academy of Pediatrics.

Dr. Samuel B. Nadler (New Orleans) is also on the teaching staff of Tulane from which he was graduated in 1936, and where he is now associate professor of medicine. He is also senior associate of Touro Infirmary, his specialty internal medicine.

Dr. Elizabeth C. Lowry (Minneapolis) is a graduate of Cornell University medical school of the class of 1935. She has practiced pediatrics in Minneapolis for six year and is on the staff of the Abbott Hospital.

Dr. John M. Adams (Minneapolis), associate professor of pediatrics at the University of Minnesota, was graduated from Columbia in 1933 where he received his M.D. and Ph.D. He came to Minneapolis for graduate work in pediatrics and has practiced that branch of medicine in the city for eight years. He is the secretary of the Northwestern Pediatric society, a member of the Central Society for Clinical Research and the Pediatric Research Society.

Dr. Robert D. Semsch (Minneapolis) is resident pediatrician of the Minneapolis General hospital. He was graduated from the University of Minnesota medical school in 1943.

Dr. Albert V. Stoesser (Minneapolis), although an associate professor in pediatrics at the University of Minnesota, is quite as interested in allergy in which he has done considerable valuable research. He received his medical degree in 1925, and having followed that with a Ph.D., he has maintained his association with the University hospital for the past 20 years. He is president of the Northwestern Pediatric society, and a member of the Society for Pediatric Research and also of the American Academy of Allergy.

Dr. Forrest H. Adams (St. Paul) prepared for pediatric practice at the University of Minnesota after graduating there in 1943. He is a member of the Northwestern Pediatric society.

Frances M. Brown received her degree, Bachelor of Science in Speech Pathology, at the University of Minnesota in 1939. As a speech clinician she has done much excellent work in Minnesota's schools and is at present central speech clinician of crippled children services in the speech clinic at the University hospital, department of pediatrics. She was the first to organize a state-wide speech field service in Minnesota with a full-time itinerant speech clinician.

News Items

Dr. C. H. Nelson, Billings, Montana, was elected president of the state board of medical examiners April 2, in Helena. Dr. E. A. Weldon of Lewistown was chosen vice-president, Dr. Otto G. Klein of Helena was re-elected secretary. Dr. Nelson has served on the board of examiners several years.

Dr. Felix Hughes Crago, 37, a former physician of Great Falls, Montana, has been made major and promoted to the post of group flight surgeon according to word received from a base in Italy where he is stationed. Major Crago received his medical training at Duke medical school, was an intern and later resident at the University of Minnesota hospital until 1939. He completed his training in aviation medicine in 1942.

Navy Lt. Charles B. Darner, formerly with the Fargo, North Dakota clinic writes from Iwo Jima "I never realized such filth and dirt existed. I've had one bath since landing and for the first week I didn't get my shoes off. The mortar and rocket fire, land mines and sniper fire have been nasty but our area is relatively quiet now." Lt. Darner has been through the Saipan and Tinian campaigns also.

Major Hugh Hawn, formerly ophthalmologist at the Fargo clinic, has been promoted in England where he is consultant at a base hospital and 14 surrounding hospitals.

Four physicians have recently been admitted by examination to practice in South Dakota and three others have been admitted by reciprocity. Among the former is Dr. Amiceto Montero, a resident of East Gardner, Massachusetts, and a native of Costa Rica. Dr. Montero will practice in the Castlewood community which, since the death of Dr. J. B. Vaughn, has been without a physician. Others admitted by examination are Dr. John C. Rodine, Aberdeen, Dr. Robert W. Spicher, Hot Springs, and Dr. Peter Steiner, Yankton. Under reciprocity were Dr. Ernest Brock, Rapid City, Dr. David McBroom, Redfield, and Dr. Robert Van Demark, Alexandria.

Dr. Edward A. Jackson, formerly of Albert Lea, Minnesota, has been appointed chief surgeon aboard the Milne, the largest hospital ship afloat. The ship has 1000 beds. Major Jackson is a graduate of the University of Minnesota medical school and had practiced in Atwater, California, before entering the service more than two years ago.

Dr. Wilfred McKechnie, Isle, Minnesota, has taken over the practice of Dr. J. C. Poore of Isle, who has joined the Navy.

The annual joint-meeting of the medical societies of Wabasha and Winona counties (Minnesota) was held April 2, at Wabasha. Speakers were Dr. Victor O. Wilson of the state department of health, Dr. Roger Kennedy, Rochester, and Dr. D. O. N. Lindberg, superintendent and medical director of the Buena Vista sanatorium, Wabasha.

A medical center that will include a four-year school of medicine, a university hospital, a school for nursing and provision for the coordination of medical care, public health and welfare activities of the state under one roof, seems on its way in North Dakota with the passage of a law by the 1945 legislature that makes possible not only acceptance of funds from individuals but also from the federal government. Dr. John H. Moore, president of the state public health advisory council in support of the measure pointed out that on July 1 of last year only 365 physicians were practicing in the state, twenty-six per cent of whom were 65 years of age or older.

Dr. Albert M. Limburg, Page, North Dakota, has been appointed physician and surgeon for the Northern Pacific railway.

The doctors and dentists of Bismarck, North Dakota, will no longer keep their offices open on Saturday afternoons. This action was decided upon in view of the acute shortage of trained help.

Senior assistant surgeon Abner I. Weisman of the United States public health service has been sent to Fort Thompson, South Dakota, the seat of the Crow Creek and Lower Brule Indian reservation and is starting an intensive public health program for the Indians in this region.

Dr. Patrick E. Kane of Butte, Montana, has been re-appointed by Governor Ford to the state board of medical examiners for a seven year term.

The Lott hospital at Livingston, Montana, has been reopened by Miss Edith Lott after the shortage of doctors compelled its closing eighteen months ago. Drs. Eloise M. Larson and John A. March are assisting Miss Lott.

Dr. C. N. Harris of Hibbing, Minnesota, was re-elected to a five year term as member of the board of directors of the St. Louis county Tuberculosis and Health association at the annual meeting in Duluth, April 17.

Dr. Mario Fischer, medical director of St. Louis county Welfare board, described to the Duluth council of social agencies, April 25, plans for a 300-bed infirmary in Duluth and a 150-bed infirmary in the northern half of the county, for the care of chronically ill and infirm, his considerations being based on a recently completed study of 1242 such patients.

Dr. J. Y. Feinstein, recently removed from Seattle, Washington, to Willmar, Minnesota, has come to Minneapolis, where he will serve as doctor for the Gopher ordnance plant and practice privately.

Dr. Owen H. Wangensteen, Professor and Head of the Surgery Department, University of Minnesota, has been named by the Office of Scientific Research and Development, a member of the three-man medical commission that will leave almost immediately for Russia.

Dr. E. E. Zemke, disabled in foreign service, reopened his offices in Fairmont, Minnesota, April 2, after a special postgraduate course taken at the University of Minnesota.

Dr. John W. Bushnell, Elk Point, South Dakota, has been promoted to the rank of lieutenant colonel, according to information received by his parents, Dr. and Mrs. W. F. Bushnell, also of Elk Point. He is now stationed in New Guinea and has recently returned from a special assignment to Brisbane, Australia.

SPECIAL LECTURES AT THE UNIVERSITY OF MINNESOTA

The first J. B. Johnston Lecture on Neurology will be given by Dr. O. Larsell of the University of Oregon Medical School, at 8:15 p.m., Friday, May 11, in the Auditorium of the Museum of Natural History (Main Campus). Subject: Comparative Neurology and Our Present Knowledge of the Cerebellum.

Mrs. Johnston, who has endowed this lectureship in memory of her husband (for many years one of the four or five greatest comparative neurologists of the world) has expressed the wish that these lectures be practical. Dr. Larsell is the outstanding authority today on the morphology and significance of the different lobes of the cerebellum. His lecture should be of interest not only to neurologists, neural surgeons and otologists, but also to clinicians generally.

On Thursday, May 10, at 5 p.m., in the amphitheatre of the Institute of Anatomy, Dr. Larsell will give a lecture on the History of Medicine in the Northwest. This subject has interested him for many years and he is now preparing to publish his findings in book form.

The J. B. Johnston Lectureship Committee:
J. C. McKinley, W. T. Peyton,
Ernst Gellhorn, A. T. Rasmussen.

NOTICE TO CONTRIBUTORS

The prices on additional covers of 4-page, 8-, 16-, 20-, 24-, 28- and 32-page reprints are reluctantly withdrawn as of this date. We found that we were offering them actually at less than our contract printer was charging us. That particular item wasn't covered by our agreement and, according to his reasoning (he also billing them below cost), a rise was only to be expected with the general increases we see about us. We can feel fortunate that the quality of our "merchandise", thanks to you contributors, is ever improving and we appreciate it.

A very few copies of the two-page Report on Poliomyelitis Studies Made at Minneapolis General Hospital as published in the January 1945 JOURNAL-LANCET are still available upon application to this office. Enclose a stamped, self-addressed envelope.

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AMERICAN SOVIET MEDICAL SOCIETY ELECTS OFFICERS Minnesota Chapter to Collect Medical Books and Instruments

Dr. Irvine McQuarrie (professor and head of the department of pediatrics at the university of Minnesota medical school) has been elected president of the Minnesota chapter of the American Soviet Medical Society. Other officers elected are: Dr. R. F. Hedin, Red Wing, Minnesota, vice president; Dr. Leo Rigler, professor and head of the department of radiology at the University hospital, treasurer; Dr. Samuel Corson, instructor in physiology at the university of Minnesota medical school, secretary. The following were elected as members of the executive board: Dr. Moses Barron, Dr. E. T. Herrmann, Dr. J. A. Lepak, Dr. M. B. Visscher and Dr. O. E. Wangenstein.

The Minnesota chapter is initiating a campaign to collect medical books and instruments to be sent to Russian medical libraries and hospitals through Russian War Relief. These books and instruments are desperately needed by the Russian medical men and scientists to help them restore the essential medical educational and research facilities in the regions liberated from the Nazis. Most of the scientific libraries and equipment of schools, research institutes, and hospitals were either destroyed by the Nazi invaders, or stolen and shipped to Germany.

Medical text books published subsequent to 1926 and written in English, French, German or Russian are most welcome. Text books published prior to 1926 are *not* desired. Classics of any date are urgently needed.

Contributions of books and instruments may be left at the office of pediatrics, university of Minnesota hospital, or at the office of the Minneapolis committee, Russian War Relief, 813 Marquette Ave., Minneapolis, Minnesota.

Sending medical books to the U.S.S.R. is not entirely a one-way affair. Soviet publishers have been very generous with their own medical publications. The university of Minnesota library has received a number of Russian medical books and periodicals, and the Soviet publishers refused any financial remuneration. However, they will be grateful for similar gifts from us.

Necrology

Dr. Alexander Dunlop, 87, Crookston, Minnesota, died March 19. He had practiced in Crookston for more than 60 years.

Dr. Darie Lemieux, 70, Rolla, North Dakota, died March 26 in a Bottineau hospital. He came to Rolla in 1940, having practiced in Fargo, Dunseith, and Stanley. He was a member of the North Dakota house of representatives in 1905, served four years as mayor of Dunseith, was a member of the state tuberculosis board of trustees and held the position of superintendent of the Rolette county board of health for several years. During World War I he was an acting assistant surgeon of the U. S. Public Health Service.



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Dr. C. I. Oliver, Graceville, Minnesota, died March 27 of cardiac thrombosis. Dr. Oliver was a graduate of the medical school of the University of Illinois, and came to Graceville in 1901 to practice here and to found the West Central Minnesota hospital. He was a captain in World War I, and was a former state senator.

Dr. E. C. Haagensen, 75, Grand Forks, North Dakota, died March 28 at the hospital of that city of a heart attack. Dr. Haagensen was the city health officer and had been a resident of North Dakota for more than fifty years. He was a member of the Grand Forks District medical society, the North Dakota Medical association, and the American Medical association. He was graduated from Northwestern medical school in 1894.

Dr. William DeCoster, 70, Mankato, Minnesota, died suddenly March 26. A graduate of the University of Minnesota medical school 47 years ago, Dr. DeCoster had practiced in Minneapolis and in Windom before coming to Mankato in 1914.

Dr. Richard S. Forbes, 59, Duluth, Minnesota, died at St. Mary's hospital after a brief illness April 9. Dr. Forbes was a well-known surgeon, was a member of the American College of Surgeons, the American Medical association, and the St. Louis county medical society.

Dr. S. S. Shannon, 62, Crosby, Minnesota, died suddenly in his office March 28 of a heart attack. Dr. Shannon had practiced in Crosby and on the Cayuna Range for 27 years.

Dr. Henry C. Cooney, 82, Princeton, Minnesota, died at his home March 28. He had retired from practice two years ago.

Dr. Christian Jelstrup, 76, Elk River, Minnesota, died April 13, having been retired by illness for six years, following thirty-five years of practice in North Dakota and Minnesota. He was a 1903 graduate of Northwestern university school of medicine.

Dr. Rudolph H. Wald, Los Angeles, California, formerly practicing medicine and surgery at Hastings, Minnesota, died March 26 in California. Dr. Wald served in World War I.

Dr. T. T. Landa, 85, Landa, North Dakota, died March 31, in a hospital at Minot. Dr. Landa was a pioneer physician of North Dakota and it was for him that the town Landa was named.

Dr. H. W. Power, 66, Conrad, Montana, died April 3, 1945, after a lingering illness. He took his medical degree at Northwestern and in 1905 came to Conrad. He started in the first hospital in Conrad and it was largely through his efforts that the present fine hospital was built.

Dr. Henry G. Blanchard, 77, died April 14 in the Fairmont (Minnesota) community hospital. Dr. Blanchard had been a member of the staff for 17 years.

Dr. Andrew F. Moynihan, 71, Sauk Centre, Minnesota, died April 12, in his home city, where he had practiced for 40 years. Dr. Moynihan was Stearns county deputy coroner and city physician of Sauk Centre. He had served as a captain in the medical corps of World War I.

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"P. I." LISTS PHARMACAL HOUSE PUBLICATIONS

Printers' Ink, for 57 years the weekly mentor and guide of publishers and advertisers, has had its department of research compile a directory of company magazines. This complete and impressively accurate roster, acclaimed everywhere as a monumental accomplishment, lists, with 5000 others, these friends of the physician: American Hospital Supply Co.'s *Tomac Tomahawk*; Birtcher Broadcaster; Borden Link, Borden Review of Nutrition Research, Borden Canadian Milky Way; Burroughs Wellcome & Co. Wellcome News; Carnation Co. Carnation; Ciba Review, Ciba Symposia; Coca-Cola Red Barrel; Hoffmann-La Roche's Roche Review and Pharmacy and Medicine in Review; Lilly Review and Physicians' Bulletin; Lederle Laboratories Bulletin; McNeil Laboratories McNeil-O-Gram; Merck Report, Merck Review; Parke Davis Therapeutic Notes; Reed & Carnick Medical Pocket Quarterly; Red Star Yeast Red Star-ter; Seale Research in the Service of Medicine; Squibb Memoranda, Medical Journal Abstracts, and Squibb Plan Bulletin; Stearns Standard; United Drug Co. Rexall Family Chatterbox (Canadian); Upjohn Overflow and Upjohn Scope; Winthrop Chemical Co. Clinical Excerpts; Wyeth News.

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ETHICAL DRUGS LEAD SALES OF AMERICAN HOME PRODUCTS CORPORATION

Again in 1944 the pharmaceutical, biological and nutritional division did the largest share of total American Home Products Corporation volume. Its 29% gross was an increase over 1943.

The third annual year book of the company, a 78-page publication titled "Toward Better Living" reports notable physical gains for the division. The year's end saw the completion of the Wyeth Institute of Applied Biochemistry which now is co-ordinating the research of all Wyeth Incorporated units.

From this laboratory came several new products including penicillin tablets for oral administration of the "wonder drug"; "Purodigin," the first American-made digitoxin to be produced in commercial quantities; methionine, one of the important amino acids; and "Bornex," a new product for the eradication of head and body lice.

For the war front and home front, Wyeth continued high levels of penicillin production and, during the year, added the submerged culture or tank process to its bottle surface culture production method.

BURROUGHS WELLCOME ELEVATES DR. NELSON

Dr. Erwin E. Nelson, director of the Wellcome Research Laboratories, Tuckahoe, New York, has been elected a member of the board of directors of Burroughs Wellcome & Co. (U.S.A.) Inc. Dr. Nelson became director of the Wellcome Research Laboratories in June 1943. He was formerly professor of pharmacology at Tulane University of Louisiana School of Medicine, and also served as chief of the Division of Pharmacology, Food and Drug Administration, Washington, D. C. Dr. Nelson is a member of various committees, including the Revision committee of the *U. S. Pharmacopoeia*, and is chairman of the subcommittee on biological assays.

UPJOHN MESSAGE URGES EARLY DIAGNOSIS OF CANCER

Spurred by a rising rate of 165,000 deaths, and 700,000 sufferers annually, Upjohn is assisting in the fight against cancer. With a message of hope which reached millions during April when the American Cancer Committee's national drive was in full swing, Upjohn included this major health problem in its "Your Doctor Speaks" series directed toward better public health and greater patient-physician cooperation. Since the greatest promise of reduction in cancer mortality lies in early diagnosis and treatment, the new Upjohn message stressed the importance of learning to "recognize warning signs of cancer before it's too late," and bluntly told the reader, "You can help—by learning to suspect cancer and to report it at once." It appeared in leading monthly and weekly magazines. Special emphasis was placed upon an immediate visit to the doctor for a check-up at the slightest suspicion of cancer. A summary of possible signs of the disease is given, based on information from cancer authorities. "Faithfully follow your doctor's advice," urges the message. "If you have a beginning cancer, he can detect it, treat it, save your life."

Members of the medical profession, cancer organizations, and public health agencies commended the optimistic, encouraging tone of the text.

SQUIBB AWARD TO MINNESOTA MAYO MAN

Dr. Edward C. Kendall, head of the section on biochemistry at Mayo Clinic, Rochester, Minnesota, for more than thirty years, has won the Squibb award of the Association for the Study of Internal Secretions for outstanding research in endocrinology. Also associated with the University of Minnesota graduate school and a professor of physiologic chemistry in the Mayo Foundation, Dr. Kendall received the Squibb award for his discovery of the active principle of the thyroid gland and the fractionation of the hormones of the adrenal cortex.

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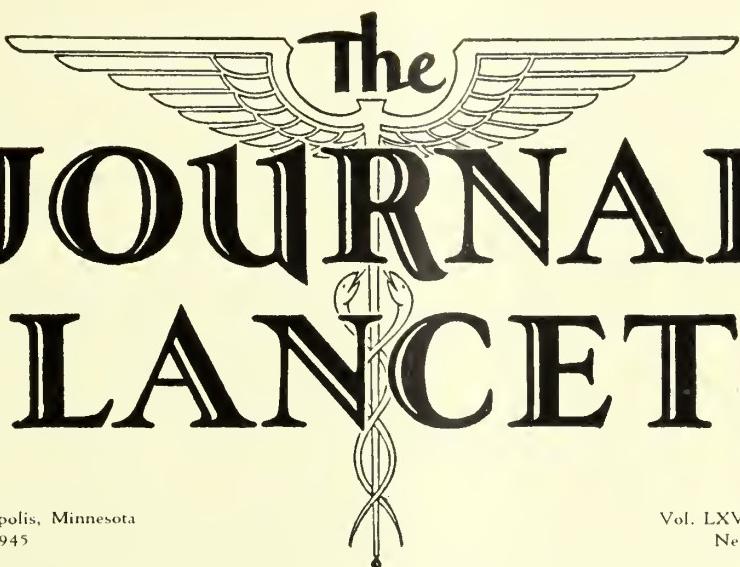


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The JOURNAL LANCET

Minneapolis, Minnesota
June, 1945

Vol. LXV, No. 6
New Series

Symposium on Obstetrics

As Prepared for the North Dakota Society of Obstetrics and Gynecology

R. E. Leigh, M.D.
Grand Forks, North Dakota

MEMBERS of the North Dakota Society of Obstetrics and Gynecology: This society was organized with the express purpose of promoting a better understanding among our members by mutual assistance, to improve the practice of obstetrics and gynecology in North Dakota. Our membership is composed of practitioners having a major portion of their work in these fields, and who by application for membership have expressed a desire to increase their competency.

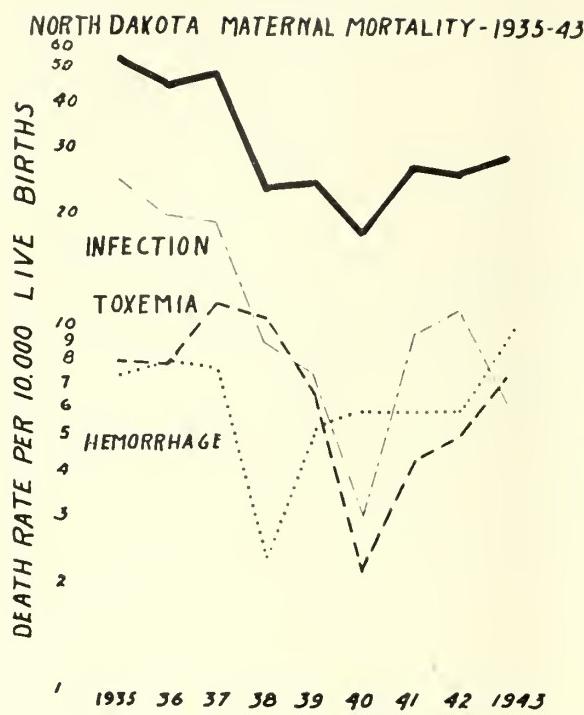
Our program for today has been developed within the purposes of this organization.

From an analysis of the statistics of maternal deaths in our state of North Dakota for the last four complete years we note that the maternal record of which we were so proud has gradually become rather bedraggled and that instead of North Dakota being the safest place in the United States to have a baby it is getting well down the list in places of relative safety. It is obvious that we can not stress effectively all the aspects that are respon-

sible for this state's backsliding, but we can take one of the phases and give it a good going over.

In these times of war this is not the only state where the average doctor is overworked. We all realize that there are many people, in these times of prosperity, that want to have a good check-up and a catch-up in physical examinations and in elective surgery, because they can now afford the cost. It is rather easy for a physician to succumb to the temptation of having an unusual number of people in the waiting room and to have a busy day in the hospital as an excuse for skimming over his patients and doing rather superficial work.

We have also with us a Dr. Jekyll and Mr. Hyde advance in therapy, that I feel merits discussion because I think too much Hyde is being seen. I refer to the misuse of the sulfonamide drugs and penicillin. In obstetrics, especially, Mr. Hyde is giving the practitioner a false feeling of confidence; tempting him to violate the time-tried and proven safe technics in favor of inter-



ference and short cuts, salving his conscience with the thought that if a little infection shows, he can give a few doses of sulfa, or a few shots of penicillin and everything will be all right. It might cost the patient a few dollars but that can always be covered to personal advantage by telling how serious their case was and how fortunate it was that modern advances pulled them out of a bad situation (a situation that never would have occurred if more skill, more honesty, and more dependence on Mother Nature had dominated the scene instead of Mr. Hyde).

From the graph you can see that since 1940 we have had a general rise in the maternal mortality in North Dakota. I do not understand the slight drop in infection unless it may be attributed to Dr. Jekyll Sulfonamide. The definite rise in the rate of hemorrhage and toxemia I feel is due to some backsliding on the part of our obstetricians. As I have pointed out, we can not at this meeting cover the entire field suggested by this chart, our program has been arranged to deal with some of the major causes of obstetric hemorrhage, and these will be discussed by our speakers.

Placenta Praevia*

E. M. Ransom, M.D.
Minot, North Dakota

IN reviewing the literature of the past several years on placenta praevia one is surprised at the great number of articles which have been written on this subject. This is especially noteworthy when one considers the similarity of these articles and the fact that very little new material has been added to our knowledge of this serious complication of pregnancy. One valuable contribution has been made, however, and that is the keeping of statistics. It has been said that anything can be proved by statistics and there are those who discount the value of the statistics published about the hemorrhages of pregnancy. Yet, with all their inaccuracies and discrepancies, statistics are valuable because they reveal to us, to a greater degree than ever before, the results of various methods of treating the hemorrhages. Moreover, if we once begin the keeping of statistics we become more acutely conscious of our mistakes and are inspired to greater individual efforts to correct them.

With this in mind I wrote to a number of our group practicing obstetrics throughout the state, asking for local statistics kept by the hospitals in which the members practiced, and I wish to acknowledge my appreciation of the response which I received. I have compiled these statistics and shall present them during the course of this paper.

But first let us briefly review what is known to date about placenta praevia.

*Read before the fall meeting of North Dakota Society of Obstetrics and Gynecology, at Grand Forks, November 18, 1944.

The etiology of the disease is still unknown, some investigators believe that multiparity is responsible for most of the cases, that disease of the endometrium which occurs as the result of infection following childbirth, so affects this membrane that proper changes for nidation of the impregnated ovum in its normal fundal location are prevented. Others believe that the formation of cotyledons on the decidua reflexa is responsible, while the most recent theory advanced is that of some hormonal disturbance as yet not understood.

This complication presents one important symptom, hemorrhage without pain. In a recent article¹ Wallace presented a series of cases to prove that placenta praevia hemorrhages are not always painless nor are the hemorrhages of ablatio always painful, but many men² disagree with him. In my own limited experience praevia hemorrhages have always been painless and from the very nature of the pathology it seems to me this should always be so, except in those rare instances of cervical obstruction which may prevent the blood from escaping from the os freely. Painless hemorrhage can occur from cervical erosions, polyps, carcinoma of the cervix or varicosities, but if the patient has been having proper antepartum care, the existence of any of these will have been discovered and careful examination under strict aseptic precautions will determine whether the bleeding is coming from any of these sources.

NO. DAK. MATERNAL MORTALITY 1934 - 1943

Number of deaths from Placenta Praevia and Rates per 10,000 live births

	Number of Deaths		Rate
	Placenta Praevia (Death before Delivery)	Placenta Praevia (With Childbirth)	
1943	1	1	1.5
1942	-	1	0.7
1941	-	1	0.7
1940	1	-	0.7
1939		2	1.5
1938		-	0
1937		3	2.3
1936		2	1.5
1935		1	0.7
1934		3	2.1

Not reported separately prior to 1940

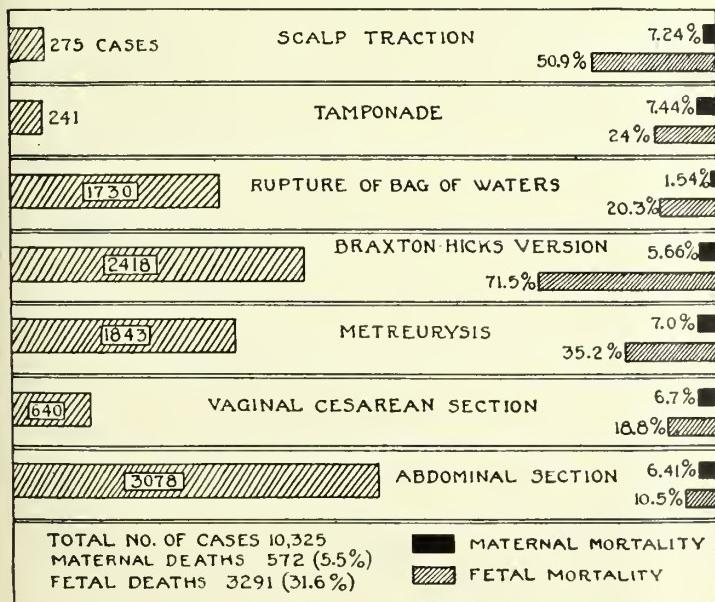
U. S. MATERNAL MORTALITY, 1940

Rate per 10,000 live births

Maternal Deaths	Placenta Praevia (death before delivery)	22	0.09
	Placenta Praevia (with childbirth)	230	0.97

The most reliable diagnostic procedure is a digital examination. This of course must be very carefully performed after proper preparation but it will definitely reveal to us not only whether we are dealing with a placenta praevia but also whether it is complete or incomplete. Opinions differ about the value of the cystogram for diagnosis of placenta praevia but I have found it quite valuable for centrally and even for some laterally placed placentas. A posterior placement probably will not show nor will a marginal, although Pentis and Tucker³ claim to be able to diagnose a posterior placement by having the patient assume a semilateral position. If one can make a diagnosis by this method he can often decide as to what treatment he will follow without the hazard of a digital examination.

TABLE



Two outstanding changes in our methods of handling placenta praevia during the past few years have served to greatly reduce mortality from this terrifying complication of pregnancy. These are the use of blood transfusions and cesarean section. Of the two, blood transfusion has probably saved more mothers than cesarean section but, combined, they have cut the maternal mortality in half.^{4,5} It is now generally conceded that a complete praevia should be sectioned. There may be justification for sectioning certain of the lesser degrees of praevia as, for instance, in the presence of a rigid elongated cervix, but it is doubtful whether a rigid cervix is often found in placenta praevia. Holmes, through personal communications from a number of authorities, found not a single rigid cervix in 626 praevias.⁶

The usual indications for cesarean section, tumors, disproportion, heart disease, etc., apply in all types of placenta praevia.

We have largely confined cesarean section to that type of praevia which completely covers the os and have usually treated lesser degrees by other methods. One of the simplest and best of these is rupture of the membranes. This allows the presenting part to descend and the placenta to retract with the changing cervix and lower uterine segment, thus greatly lessening the chance for a repetition of the hemorrhage. If the presenting part is a head it serves to tampon the placenta and labor pains are usually initiated if they have not already started. The additional use of a Willett forceps will control the hemorrhage until delivery takes place. Some men use small doses of pituitrin to encourage labor pains. After several cases of shock, some of them severe, we gave up the use of pituitrin in any obstetrical procedure several years ago and have since used pitocin.

If a breech is presenting, a leg should be brought down to act as a tampon. Other methods of controlling hemorrhage or of hastening delivery are the use of a tamponade, the bag and Braxton-Hicks version. Accouchement forcé, Duhrssen's incisions and vaginal section are to be condemned.

Davis says⁷ that vaginal tamponade has fallen into complete discard, and that Braxton-Hicks version and metruerysis are fast losing their popularity, but most writers do not go this far in reference to these procedures and some still feel that the last two are invaluable in certain cases of lateral and marginal placenta praevias.^{8,9}

If tamponade is to be used, I believe it should be used as described by Jarno in the *American Journal of Surgery*.¹⁰ He uses, instead of gauze, several strips of cot-

Table of Mortalities in the Treatment of Placenta Praevia. (H. B. Benaron)

Like all statistics these should not be accepted at their face value; e. g., rupture of the membranes has the lowest mortality, but this is because only the milder cases, placenta marginalis, are thus treated. In Browne's 252 collected cases where scalp traction was used, the maternal death rate was only 3.5 per cent and the fetal mortality was 46.4 per cent.

MORTALITY OF PLACENTA PREVIA AS INFLUENCED BY THERAPY*

Therapeutic Methods	Maternal Mortality				Fetal Mortality		
	Number	Died	Per Cent	Per Cent Morbidity	Number	Died	Per Cent
Ruptured Membrane.....	2,070	37	1.8	4.8	1,958	436	22.2
Spontaneous Birth.....	3,068	70	2.3	4.8	2,244	525	23.4
Hydrostatic Dilators...	4,464	263	5.9	16.2	3,113	1,542	49.5
Hicke Version.....	10,660	686	6.4	23.2	8,213	5,523	67.2
Cesarean Section.....	5,166	337	6.5	40.3	2,154	533	24.7
Vaginal Tamponade.....	477	32	6.7	....	475	239	50.3
Accouchement Force'....	291	71	24.4	22.6	282	133	47.2
Totals.....	26,196	1,496	5.7	.....	18,439	8,931	48.4
Findley's Grand Total... :	47,828	3,454	7.2	.....	27,047	14,427	53.4

* Holmes' Paper in the American Journal of Surgery. Adapted from Findley's analysis of 47,828 cases, with relative morbidity rates as reported by Irving.

STATISTICS FROM NORTH DAKOTA HOSPITALS COVERING FIVE TO TEN YEAR PERIODS.

HOSPITAL	No. of deliveries	Years covered by Report	Number of Previae	Type	TREATMENT	Mortality		Blood Loss		Transfusions		Pars	
						Complete	Incomplete	Mother	Baby	B.g.b.	R.B.C.	Gross	Pars
DEACONESS	4163	10	24	6 3 ect classified	Version Tagedal-Pack Ruptured Membr. Cesarean Sect.	5 1 3 12	0	8					
ST. MICHAEL'S	2471	8	20	3	17	Spontaneous Del. Version Braxton - Ricks Low Forceps Section	4 1 1 6 6	1 1 1 Placenta	6			4 pts.	
ST. LUKES	2062	5	25	4	21	Voorhees' Bag Ruptured Membr. R. Mem. & Williste. Cl. R. Mem. & leg in breech Section	2 14 3 2 4	0	3				?
ST. JOHNS	5066	8	23	10	13	Rupt. Membr. & Spont. Del. Rupt. M. & Breech Extr. Rupt. M. & Low Forceps Section	6 1 1 15	0	8	35% : 1,900,000 Rupt. M. & Breech Extr. : 4,260,000 Highest	10 Transf. Some several times	19	Primip
MERCY	2518	10	14	1	13	Rupt. Membr. Induction Pituitrin & Bag Breech & foot brought down Section	6 2 1 5	0	2				7 5
ST. ALEXIUS	3893	10	73	19	54	No Treatment Induction on Incomplete Induction on Complete Braxton - Ricks Section on Complete	22 33 2 2 14	10 Stillborn 0 15 5 expired					
EVANGELICAL													
ST. JOSEPH'S	2727	8	17	4	13	Conservative Vaginal Manual Section	17 2 2	0	1				
TRINITY	4001	10	19	7	12	Version & leg bro't down Braxton - Ricks Spontaneous Delivery Rupt. M. & Bag Induction Taq. Pack & Bag Induction Low Forceps Section	2 2 4 1 1 1 2		11% : 1,000,000 Rupt. M. & Bag Induction : 4,900,000 Lowest and Highest	30 Transf. 13 pts. Some several times	17	Primip 2	
TOTAL	26961	215	54	54	158			2	48			27 pts.	

ton 15 cm. long, 2 cm. wide tied together with tape and wrung out of a mild antiseptic solution. These he packs firmly into the fornices. He claims that the effect of this packing is not only to stop the flow of blood but to make direct pressure on the great cervical ganglia of Frankenhauser and thereby initiate labor pains.

Holmes, too, while deprecating the use of the tampon, says that strips of gauze are inadequate for packing placenta praevia before delivery, and that sterile absorbent cotton soaked in approved antiseptic solution must be used.¹¹

In the use of the bag most authorities agree that the intraovular insertion is safer, since it does not serve to strip the placenta still further from its attachment and does not permit the bag to come in contact with the uterine surface of the placenta, where infection is most likely to be introduced.

Braxton-Hicks version is difficult and statistically carries a rather high maternal and fetal mortality, but there

are cases in which it seems to be the logical way of handling a partial praevia.

Of the advances made in the conduct of placenta praevia, I wish again to stress the use of blood transfusion as being the most valuable. One of the very first things to be done when a case of placenta praevia of whatever type comes under our care is to get blood donors, several of them, have them matched and ready for use, and use them to replace any considerable amount of blood loss or to prepare for cesarean section. There is no real substitute for blood transfusion in placenta praevia.

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Abrupto Placenta*

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THIS term is used to denote the premature separation of the normally implanted placenta. To most of us, this is one of the obstetric headaches that is put in the class of transverse presentations, after-coming hydrocephalic heads—all those things that we think of ever so often but immediately try to forget as soon as possible. Abruptio or ablatio placenta has a habit of showing up when least expected and then we quickly try to remember the substance of the last article in the Journal that produced so many happy results.

I have tried to cover the literature of the past seven years on the subject as thoroughly as possible and it seems that articles are appearing much less frequently the last few years than they did in 1937. There is a reasonable explanation for this, however. Practically every author gives toxemia as the most important etiological agent in producing this condition. Adequate prenatal care is lowering the incidence of toxemia in all well controlled clinics, and these are the clinics or medical centers that are producing the papers. Maybe the falling rate of toxemia is bringing on such a decrease in the incidence of abruptio that research men are losing their interest. This is entirely my own deduction and I have no figures to bear this out. In fact, there may not be a decrease in the incidence of abruptio, it may even be increasing. One's own limited experience in a comparatively rare complication is most deceiving. However, the few papers appearing in the recent literature have prompted me to make this deduction.

In abruptio placenta (other names are ablatio-premature separation, uterine apoplexy, couvelaire uterus, etc.),

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the separation of the placenta may be complete or partial and this determines the seriousness of the complication. Bleeding always occurs when the placenta separates although there may be no external evidence of it. It is then called "concealed hemorrhage," and may be caused by adherent edges of the placenta, rupture of a hematoma into the amniotic sac, or a tightly fitting head in a firm engagement. When these conditions are present, the patient may exhibit all signs and symptoms of hemorrhage with no external bleeding visible. However, the bleeding is usually profuse enough to dissect its way down between the membranes and the uterine wall and show externally from the vagina. Both concealed and external bleeding may be present in some instances and consequently the amount of shock may be all out of proportion to the amount of blood lost. When concealed hemorrhage is present, and in many cases when both concealed and external hemorrhage are present, the force of the bleeding may cause interstitial hemorrhages in the uterine wall. This may prevent efficient contraction of the uterus after it is emptied either by cesarean section or from below.

The figures on premature separation of the placenta vary so much as to be almost worthless. Some authors place all degrees of separation in their statistics, others only the severe types. Williams gives an incidence of almost one in 150 pregnancies. Davis and McGee found that it occurred once in 770 of these. Cosgrove & Conway of Jersey City in 42,807 "live births" (?) found it occurred in 1 to 181, but their total fetal death rate is 49 per cent, so their figures do not help much. They had 236 cases, 148 mild and 88 severe. No mothers died

in the mild group but four mothers died in the severe group. Fifty patients of the severe group had cesarean section with a mortality of 4 per cent. Thirty-eight patients had conservative treatment with a mortality of 5.26 per cent. These are 1941 figures.

Although we do not have the last word on the incidence of abruptio placenta, we do know that the severe type with large concealed hemorrhage and uterine muscle destruction is rare, and, we hope becoming rarer with better control of toxemias. Fortunately, minor degrees of separation occur much more frequently than the severe types. This is most likely to occur when the placenta is implanted a little low and that surface of the placenta which is implanted on the lower uterine segment where decidual development is poorest, may separate. External bleeding is usually moderate and early in these cases and general symptoms of hemorrhage may be minimal or entirely lacking. This hemorrhage is usually very moderate with no external manifestations and may not even be suspected until the placenta is examined after delivery.

In all cases of premature placental separation, however, a subplacental hematoma is formed and the resultant pathology, clinical picture and prognosis are all dependent on one of the following forms that it may assume:

1. It may be confined to the limits of the placenta.
2. It may separate the membranes wholly from the uterine wall with varying degrees of separation of the placenta.
3. The membranes may rupture with hemorrhage into the amniotic cavity.
4. The membranes may separate down to the internal os with hemorrhage into the vagina.

In the first three varieties the hemorrhage is concealed while in the fourth it is external. In the last the prognosis is best because the condition is recognized earlier and also because the pressure is lessened and therefore less likely to produce damage to the uterine musculature.

The hemorrhage may rupture into the amniotic cavity or it may dissect its way through the uterine musculature and serosa and escape into the peritoneal cavity. In these cases the patient may exsanguinate herself without any external bleeding. These are the rare, serious cases that show the profound symptoms of shock and anxiety early.

The etiology of premature separation of the placenta is essentially unknown. There are cases which are purely traumatic but these are rare. Direct external trauma, traction on a short cord, injury through performance of version, uterine collapse after birth of the first twin and the improper use of pituitrin may produce traumatic premature separation of the placenta.

Structural defects as well as psychoneurotic causes have been pretty well discounted as etiological agents in producing this condition.

Because of the frequency of accompanying manifestations of toxemia in abruptio placenta, it would seem that some etiological connection exists. However, in fully 50 per cent of the cases, our present methods of detection do not uncover toxemic tendencies. It may be that there is some toxin elaborated in certain systemic diseases and

in toxemia capable of producing premature separation of the placenta. The nearest approach to this has been made by Hoffauer. He has injected histamine into animals whose placental structure is similar to that of man, and produced the exact clinical and pathological picture of abruptio placenta.

The symptomatology is very variable. Undoubtedly the condition occurs in many cases of spontaneous, uncontrollable abortion. In many of these a careful examination of the placenta will show all the changes found in the more serious type occurring in the last two months of pregnancy.

The symptoms vary principally with the severity of the hemorrhage, and also according to whether the hemorrhage is external or concealed. The amount of blood which has escaped from the vagina must never be taken as a gauge of the amount lost to the maternal circulation.

The diagnostic signs are both fetal and maternal. If the fetal circulation is interrupted suddenly by massive placental separation, the sudden asphyxia will cause violent fetal movements for a short time followed by death. If the arrest of circulation is slow, the violent movements will be absent and the child gradually passes into death.

The maternal signs are of two types: (1) those referable to the blood lost, (2) those referable to the uterus itself.

In severe cases the signs of acute anemia are always present. The lips and mucus membranes are pale, the skin and extremities are cold, the pulse and respirations are accelerated. Blood counts will show a falling erythrocyte and hemoglobin estimation. A number of these cases show a high leukocyte count, and there seems to be some connection between an extremely high leucocyte count (say 40,000 or so) and uterine apoplexy. Frequent blood pressure determinations will show the rapidity of hemorrhage, but one must not forget that the attendant toxemic condition with its associated hypertension frequently complicates the picture.

Dizziness, syncope and shock are natural sequences, and are directly proportional to the amount and rapidity of the blood loss. All grades of nervous depression are common. It is very easy to misinterpret this nervous depression and assume that it is due to the common "nervous instability" so often found in pregnancy. If the signs of acute anemia are also present, however, this mistake should not be made.

As was mentioned before, in all cases of ablatio, there is a time when only the subplacental hematoma is formed. There may be an interval of hours to many days before any external signs of blood loss is manifested. If sufficient time elapses for coagulation to take place, the clot will eventually contract and there will be an extrusion of blood serum into the uterine cavity, which will be expelled from the vagina in the form of a pinkish discharge. Later the clots may be expelled and they are characteristically old and black. If the hemorrhage is continuing, free blood will be expelled.

Many of the old authors placed much stress upon the diagnostic value of the type of external bleeding. They contended that if the bleeding was systolic, that is if it occurred with uterine contractions, it was probably due

to abruptio placenta; if diastolic, occurring between uterine pains, it was more likely to be due to placenta previa. This sign is probably of only slight diagnostic significance.

The signs referable to the uterus are much more definite and concise.

The pain accompanying ablatio is in sharp contrast to the absolute absence of pain in placenta previa. The pain in ablatio may be only a localized discomfort or it may be the most agonizing possible. The afflicted woman may have the feeling that she is bursting. If the placenta is implanted anteriorly there may be a definite area of tenderness.

The distention of the uterus is entirely dependent upon the amount of blood remaining in the uterus. The patient is prone to notice and complain of this distention before it is observed by the obstetrician. When distention is present with other signs of ablatio it is important, but its absence is not.

The consistency of the uterus has been the cause of much controversy in the last few years. The late Dr. Williams gave prominent mention to the "board-like" rigidity of the uterus in cases of ablatio placenta. However, if one awaits the time to elicit this in all cases of ablatio, the diagnosis will certainly be unduly delayed. The rigidity of the uterus, or the tonus of the uterine musculature varies greatly in physiological pregnancy. The same is true in cases of ablatio placenta. Once labor has begun, the tone or rigidity of the uterine muscle is stepped up in normal pregnancy and palpation of the fetus is more difficult. This increase in muscle tone must be taken into account in the diagnosis of ablatio placenta.

In the diagnosis of ablatio placenta the following points must be kept in mind.

1. The typical attack comes on with pain of varying degree.
2. Syncope and nervous depression may cloud the picture.
3. The anxiety may be out of all proportion to the evidences of anemia present.
4. The pulse is accelerated in accordance with the amount of blood loss and shock.
5. The temperature is usually lowered.
6. In toxic separation, the blood pressure may even be above normal, and in the Couvelaire type of ablatio it may be normal due to the associated toxemia.
7. The patient may complain of a sense of distention, even to the point of "bursting."

The one outstanding condition which must be differentiated from acute ablatio with concealed hemorrhage is syncope. The presence of uterine pain, the history of previous attacks, and the absence of apprehension when the faintness is relieved, will help in making an accurate diagnosis.

The prognosis in ablatio placenta is not favorable. Under the very best of conditions, in large series of cases, the mortality in severe cases will be higher than 50 per cent for the infants and higher than 20 per cent for the mothers.

TREATMENT

First and foremost in the management of ablatio, as is the case in all hemorrhagic emergencies of pregnancy, a number of compatible blood donors should be secured. This should be done before any examination or preparation of the patient is done if the symptoms of shock are obvious.

In serious cases, at any stage of pregnancy or labor, the pregnancy must be terminated as soon as possible in the interest of both mother and the child. Common sense and judgment must be used rather than any fixed set of rules. The factors that must be taken into consideration, in the obstetrical management of ablatio placenta are the following:

1. The stage of labor (particularly the degree of dilatation of the cervix).
2. The parity and the efficiency of the uterine pains.
3. The stage of pregnancy or the viability of the fetus.
4. The dystocia present.
5. Infection, actual or potential.
6. The skill, judgment and experience of the obstetrician.

In the actual treatment of ablatio placenta the following procedures are used:

1. *Watchful expectancy.* This type of treatment is only to be used in extremely mild cases. In other words those cases of separation in which blood loss has not complicated the picture, or in which bleeding has stopped, may be treated expectantly. However, a sudden occurrence of the fulminating type must always be kept in mind.

The use of rubber bags is rapidly falling into disrepute in recent years. The results following the insertion of a bag are uncertain. Many hours may elapse before sufficient irritability of the uterus is aroused to produce dilatation. Time is of the utmost importance in the treatment of severe cases, and one can not afford to gamble with his methods. The bag should be reserved to borderline cases where there is some doubt in the diagnosis between a marginal placenta previa and an abruptio placenta.

Carl Henry Davis, in his system of Gynecology and Obstetrics, devotes some space to the advantages of manual dilatation in abruptio placenta. He contends that the acute anemia, the uterine distention, and other toxic factors predispose to relaxation of the cervix. His big argument, however, is that it is a time-saving procedure and in this we will have to agree as it is a much simpler process to prepare for manual dilatation than for cesarean section. Following the dilatation, he advocates the use of either forceps or version, whichever seems to be indicated. It seems, however, that the additional trauma to an already traumatized uterus, and the obstetric skill required to complete the procedure, contraindicates this as a routine measure.

In the great majority of cases, this catastrophe will befall the patients who are unprepared for delivery, the cervix unefaced and undilated. In serious cases of this type, cesarean section at the earliest possible moment is the only alternative. In the choice of an anesthetic, the time required for its administration is an important fac-

tor in abruptio placenta. It would seem that caudal or spinal anesthesia is the ideal method to use in this condition. Both are being used much more in recent years as anesthetics for cesarean section and certainly the advantages to the infant, if viable, are obvious.

It may also be added that in *most* severe cases, progressive increase in size of the uterus with increasing pain and loss of the uterine ability to contract and relax, indicates an advancing process that is rapidly becoming serious. Even though these patients seemed to have been in normal labor previously, further delay in delivery is dangerous. In these patients the uterine wall may be so infiltrated by interstitial hemorrhage that in the majority of cases it will not contract even when emptied and oxytoxic drugs are administered both in the uterine wall and intravenously. In these cases the hemorrhage will continue and the patient will exsanguinate herself unless the uterus is amputated. The general appearance of the

uterus during cesarean section, its response to oxytoxic drugs, and the condition of the patient should determine whether the uterus should be amputated or not.

I would like to conclude this paper by quoting verbatim, Dr. DeLee in the 1936 *Year Book of Obstetrics*, in which he discusses an article on ablato placenta:

"There is such a thing as obstetric sagacity. One might call it intuition, and it is the better part of the foundation of the art of obstetrics. The other part is the science of obstetrics. Why, in two cases, which to the average man seem identical, the real obstetrician will deliver one by section and the other from below is not always clear. The decision is compounded of experience, scientific study of the case, the published experience of others, the environment, the patient, the executive ability of the one on whom the decision rests and only perhaps on *only just because*."

Diagnosis and Treatment of Ectopic Pregnancy*

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THE subject of "maternal deaths" is demanding, as it should, an ever increasing spotlight by physicians, mothers, and shall we add, the press. Recent compiled statistics reveal an ever lowering rate due to better pre-natal and obstetrical care combined with the advent of the sulfa drugs and penicillin. However, increasing in the percentage of deaths are those due to hemorrhage. Ectopic pregnancies almost always require treatment for hemorrhage, and therefore a discussion of ectopic pregnancy is timely.

Because a large majority of intra-abdominal hemorrhages caused by ectopic pregnancies are spectacular and dramatic in their onset, many cases have been collected,—single instances by different authors who have described the period of gestation, the position of implantation—interuterinely or intra-abdominally, etc. However, for our discussion I have chosen to define ectopic pregnancy as a pregnancy occurring outside of its normal area.

Cases of extra-uterine pregnancies were reported as early as the 11th century by Albucasis and Francis Rousetti, the diagnosis having been made after ulceration through the abdominal wall. In 1500 Jacob Nuper incised his wife's abdomen and recovered a large calcified fetus with full recovery of the patient. Reports of retained calcified fetuses from several to seventy-five years old are in the literature. However, one of the first abdominal sections to gain a living baby of ectopic implantation was reported by H. J. Shelton in the *Journal O. B. Gyn.*, December 1913. The incidence reported by a number of authors including H. E. Miller of New Orleans and published in *American Journal O. B. Gyn.* in April 1940 is about .33 per cent. In a study of 865 cases occurring from 1924 to 1936 in the New Orleans

General Hospital, 80 per cent occurred in women between the ages of 17 and 33.

The etiology is usually mechanical obstruction of the fallopian tubes, either acquired or congenital. The remainder, under the head of "theory," are variably held to be due to disturbed transportation of the ovum or to the ovum's developing its capacity for implantation before it reaches the uterus.¹

SIGNS AND SYMPTOMS

Because of multiple pathological varieties and numerous courses of ectopic pregnancy, the symptoms are extremely variable and frequently baffling. The four most important and constant findings, however, are:

Pain which is either mild and diffuse if there is no bleeding or only slight oozing, sharp and agonizing if there has been a rupture with profuse hemorrhage.

Vaginal bleeding, the blood usually dark with no tendency to clot.

Shock due to intra-abdominal hemorrhage or to visceral trauma from rupture.

Missed menstrual period with usual spotting, fainting, dizziness, or weakness following straining and an intuition of probable pregnancy.

Physical examination often reveals the genital signs of early pregnancy (Hegar's sign is absent) and in most instances the mass of the unruptured ectopic pregnancy is felt. If ruptured the usual hematocoele in the culdesac is quite definite.

Ricci and Di Palma wrote in the diagnosis of ectopic gestation—"accuracy does not prevail."

The Aschheim-Zondek or Friedman test is of value in the unruptured or early ruptured cases. Late diagnosis is usually made after the gestation has gone well beyond nine months, usually with the x-ray the deciding factor.

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Curettage reveals intact decidua tissue without chorionic villi.

The diagnosis of the dramatic type of ruptured tubal pregnancy should be readily made and should not necessitate culdesac puncture, curettage, and Friedman tests.

TREATMENT

This is distinctly surgical and imperative when accompanied by severe abdominal hemorrhage. Treating shock, typing blood, and extra diagnostic procedures add only to the mortality rate. This conception is not held by all who report cases but a review of the literature on the subject—there are volumes—indicates quite clearly that treating the shock should be instituted only while the operating room is being prepared and during operation, that it should be painstakingly done in the realization that bleeding has at times ceased because of the lowered blood pressure and increasing the blood pressure adds only to continued or renewed bleeding.

Johannes Thies of Leipzig is accredited with first using auto-transfusion in these cases no earlier than 1914. It may be kept in mind, but I can see no especial advantage in it by prolonging operation.

Let me again emphasize that the treatment of ectopic pregnancy is distinctly surgical.

The various techniques need not be discussed. The important thing is to get into the abdomen and out of it again with the least amount of manipulation and trauma.

The prognosis is excellent and the results are dramatic

if rapid, rational preoperative and operative measures are carried out.

Warmth, morphine sulphate, and marked elevation of the foot of the bed give very noticeable improvement. At operation the patient should be kept in extreme Trendelenburg. Do not lose a drop of intraperitoneal blood unnecessarily. Locate the bleeding point and remove the tube with careful haste. If the fetus has aborted and is not easily found, do not prolong operation by seeking for it. Clots do not have to be removed. Close the abdomen without drains.

In advanced pregnancies,² if the fetus has died, wait two weeks or more until thrombosis of the placental vessels has taken place. In the event of difficulty in removing the placenta, trim off the membranes, ligate bleeding portions, and leave the placenta. Do not pack or drain. Packing will be unnecessary if the operator has not caused bleeding. In the event of infection, marsupialization of the membranes and packing of the cavity seem to give best results.

Arguments and opinions vary as to the possibility of delivery of a viable fetus but the death rate from watchful waiting strongly suggests that surgery is indicated as soon as the diagnosis of ectopic pregnancy is made, rather than waiting for perforation and severe hemorrhage and infection to have their turn.

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Treatment of Deafness, Ear-Noises and Dizziness by Hypothermic Therapy

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PERHAPS no symptoms cause more aggravation than those of eighth nerve irritation—namely, deafness, ear-noises, and dizziness occurring singly or, even worse, in unpleasant combinations. Except by the removal of the cause of the disturbances if and after such cause be found, the treatment of these symptoms has been for the most part slow and unsatisfactory. A rapid safe means for symptomatic relief which may at times prove to be lasting, is therefore worthy of consideration.

HYPOTHERMIC VERSUS HYPERTHERMIC THERAPY

Before describing the application of hypothermic therapy used in the treatment of eighth nerve disturbances, it might be well to compare it with hyperthermic therapy as a method of treatment of ear conditions in general. Hyperthermic therapy has been used in all forms, i. e., dry heat, wet heat, and electrically induced heat, for many years and is mentioned only because of the marked difference in its actions and the results to be expected. Thus, when heat is applied, particularly when the temperature goes over 108° F., blood vessels become dilated,

the blood flow is increased, and there is often a mild inflammatory reaction added to the simple thermal effect. The increased flow of blood increases the thermal conductivity of the tissues and distributes the heat over a large area, often increasing the temperature of the entire body. The local area treated even after one hour of heating at a temperature above 108° F. may not rise above four degrees at the junction of the dermis and subcutaneous tissue (2 mm. deep) as tested by a thermocouple. In contrast, application of cold to a similar body area, particularly when the temperature is 56° F. or below, causes a marked vasoconstriction with reduced circulation and the deeper tissues take on the temperature of the surface within a relatively short time without greatly affecting the temperature of the rest of the body. Thus, if the cold application at 56° F. is applied to a skin surface for only one-half hour, the thermocouple placed twice as deeply (4 mm.) below the surface, registers a fall often of as much as 20° F. and the general temperature of the rest of the body is not affected. Thus, using hypothermic therapy a profound lowering of tem-

perature over a relatively small area such as over the petrous portion of the temporal bone containing the labyrinth and the endings of the eighth nerve, may be attained relatively rapidly without producing noticeable general effects, a result impossible with the use of hyperthermic therapy. Furthermore, application of heat causes an increased rate of metabolism while cold decreases the rate. Therefore, application of heat over areas of relatively poor blood supply such as the petrous portion of the relatively ischemic bone might endanger vital nerve cells through the inability of the blood vessels to dilate sufficiently to take care of the increased heat and metabolism and to supply the necessary blood for cooling purposes and fuel. This is particularly true when temperatures in excess of 113° F. are used as in diathermy and inductotherm. In contrast, when cold applications below 59° F. (15° C.) are used, the primary vasoconstriction is followed by vasodilatation. The metabolic rate is reduced by the cold and the blood supply is markedly increased—a very desirable condition in ischemic conditions. Benefit may also result from the formation and exchange of tissue fluids, such as endolymph in the labyrinth. The interchange of fluid depends on the normal physical balance between the hydrostatic pressure of the blood in the capillaries and the osmotic pressure of the protein colloids, which, unable themselves to pass through the capillary walls, exert an attraction for watery solutions of the diffusible substances. Thus, when an increased flow of blood and pressure in the capillaries can be obtained without increasing metabolism or endangering tissue, as is possible by hypothermic therapy, increased fluid transfer to and from the endolymph is made possible.

CLASSIFICATION OF DEAFNESS, EAR-NOISES AND DIZZINESS

For the purpose of therapy we may classify these symptoms occurring singly or in combination as primary and secondary. The primary group includes affections of the terminal portion of the eighth nerve for which no known therapy has proved satisfactory. The secondary group includes all affections of the eighth nerve for which definite and often simple easily removable causes may be found. Among the more common conditions of the secondary group are: Obstructions of the external auditory canal, such as by wax, epidermal masses, granulations, and tumors; interference with ventilation of the tympanic cavity due to obstructions of the eustachian tube, or accumulations of mucus, pus, and masses of epidermis in the tympanic cavity, such as in otitis media; general causes such as septicemia, uremia, drug poisoning (due to quinine, alcohol, arsenic, tobacco, etc.), allergy, blood dyscrasias (such as pernicious anemia, syphilis, and leukemia), hemicrania, reflex spinal and cranial neuritis (such as tic douloureux and facial nerve neuritis), brain tumor, cerebral vascular lesions, and general circulatory failure.

INDICATIONS FOR HYPOTHERMIC THERAPY

Obviously in the primary group where no satisfactory therapy is known, a therapy which is simple and quick to administer and often gives rapid symptomatic relief is definitely indicated. This is particularly true in oto-

sclerosis and Meniere's disease. When a definite and easily removable cause is found as in some instances of the secondary group, then, certainly, the removal of such cause is the immediate treatment of choice. However, should such treatment fail to relieve due to damage already inflicted by such cause, or should there be an expected prolonged interval between removal of the cause and symptomatic relief, hypothermic therapy may prove a valuable adjuvant measure. The use of hypothermic therapy has proved very beneficial to a large variety of patients suffering from a variety of forms of eighth nerve disturbance where other therapy including hyperthermic therapy (infra-red, inductotherm, and moist heat), galvanism, pneumomassage, chemotherapy, and surgery have failed.

PHYSIOLOGICAL BASIS FOR HYPOTHERMIC THERAPY

Hypothermic therapy is based upon three well-known and proven physiological phenomena: 1) the phenomenon of paracusis Willisii, i. e., the well-known improvement in hearing noted by sufferers of otosclerosis in the presence of loud noises such as experienced when riding in trains, in the presence of loud music, or when working in factories; 2) the marked stimulating effect of cold water run into the external ear as induced by a nystagmus due to stimulation of the vestibular division of the eighth nerve; 3) the proven fact that interference with the circulation of the labyrinth will cause deafness, head-noises and dizziness, varying in degree with the extent of the anemia induced. The phenomenon of paracusis Willisii has been explained by Lowenberg and Urbanschitach as an increased sensitivity of the acoustic nerve brought about by a general concussion or vibratory stimulation. It therefore occurred to me that if similar stimulation could be induced by other means, the phenomenon of a similar paracusis Willisii should be evidenced. This was actually found to be the case in a large series of cases of deafness and tinnitus, in which rapid lowering of the temperature of the skin and underlying bone over the endings of the eighth nerve was produced by hypothermic therapy. The head-noises diminished and acuteness of hearing was greatly increased. The reason for using cold to stimulate the eighth nerve was the well-known sensitivity of the vestibular division of the eighth nerve to cold, a sensitivity also found to be present in the cochlear division. Furthermore, the application of cold below 59° F. to a body area has been proven to cause vasoconstriction followed by vasodilatation and increased blood supply. In view of the pathology known to be existent particularly in otosclerosis, some lasting relief might be expected following the secondary increased blood supply to the labyrinthine capsule. Furthermore, since the symptomatology of deafness, head-noises, and dizziness in general follows anemia of the nerve endings of the eighth nerve, when the blood supply is increased, such symptomatology might reasonably be expected to be reversed.

ETOLOGY OF OTOSCLEROSIS

According to Shambaugh, otosclerosis is responsible for 45 per cent of all adult deafness and for that reason the pathology involved is of particular interest. Otosclerosis

is a primary disease of the labyrinthine capsule characterized by a spongoid transformation of bone which extends into the fossulae fenestrae vestibuli and envelops the foot plate of the stapes and advances to the cochlea. There is evidence that this is a degenerative process secondary to an interference with circulation, in which there is a hyperostotic porotic focus with sharp lines of demarcation. There is no cellular evidence of neoplasm or inflammation, the capsule undergoes degeneration and resorption, and into the resorption spaces the fibrogenic marrow grows. Young fibrogenic marrow is calcified into reticular bone and the focus extends. The process starts in the enchondral layer but may involve the periosteal bone and periosteum as well as the endosteal bone and endosteum. The eighth nerve endings are deprived of their blood supply as the condition progresses and the symptoms develop in the same manner as can be demonstrated more rapidly by experimentally interfering with the blood supply of the eighth nerve. Thus, the first interference with the blood supply of the cochlear division of the eighth nerve will bring about loss of hearing of low tones and sensory irritation evidenced by head-noises, followed by complete loss of hearing as the condition progresses. Thus, also, there may be some loss of equilibrium and dizziness when the vestibular division of the eighth nerve becomes deficient in blood supply followed by nausea and vomiting if the condition progresses. It would seem, therefore, that by reversing the pathology of decreased blood supply to the labyrinthine capsule by hypothermic stimulation, definite benefit might be expected. Such benefit, in fact, is found to be in evidence in a large number of patients so treated. The phenomenon of paracusis Willisii which is so typical in early otosclerosis can be duplicated by hypothermic therapy by using cold stimulation to the eighth nerve instead of vibratory stimulation.

Etiology of Meniere's Disease

This is a relatively rare affection of the labyrinth due to disturbed pressure of endolymph therein. It may be caused by vascular disease, acute or chronic, or by infectious purulent disease. It is characterized symptomatically by sudden onset of vertigo, tinnitus, nausea, nystagmus, and progressive deafness. The symptoms are brought on by disturbance of pressure (usually increased) in the labyrinth interfering with the blood and lymph supply of the eighth nerve endings. The condition may be acute, followed by death, or may be milder in character followed by severe dizziness, loud head-noises, and loss of hearing. The only prompt relief that has been obtained to date has been relief of dizziness by severing the vestibular division of the eighth nerve or by severing both divisions of this nerve, bringing about loss of head-noises, to be sure, but total deafness as well. The medical therapy for Meniere's disease has proven unsatisfactory and the patients have been most miserable for prolonged periods of time. However, Dr. M. Atkinson, of New York, claims to have had some success in the treatment of Meniere's syndrome by the use of histamine and vasodilator drugs for the possible dual mechanism that apparently produces the syndrome. Patients sensitive to his-

tamine whom he classifies as the vasodilator type are desensitized and the group not sensitive he treats with vasodilator drugs, particularly nicotinic acid. He bases this therapy on the theory that Meniere's syndrome is due to vasoconstriction or vasodilatation of the capillaries of the stria vascularis with disturbed permeability of the thin walls and consequent production of endolymph with resultant disturbed pressure and function in the cochlea and vestibule. I have found that Meniere's syndrome has frequently responded very favorably to hypothermic therapy in a single treatment used alone or as an adjunct to medical therapy particularly as outlined by Dr. Miles Atkinson.

ILLUSTRATIVE CASES OF OTOSCLEROSIS TREATED

Case 1. Mr. R. T., age 43, merchant, came in complaining of difficulty in hearing and head-noises. Examination revealed essentially normal physical and clinical findings. Examination of the ear revealed the tympanic membrane to be normal, eustachian tube permeable to catheterization, Renne's test to be normal, and the low tones to be relatively inaudible with good perception of the high tones. The patient was thought to be suffering from otosclerosis and given hypothermic therapy on the following dates: June 6, 10, 19, 29, July 1, 3, 5, 8, 10, 14, 20, August 3, 8, 16, 23 and 30, 1944. At this last date his hearing for low tones had returned to about normal and the head-noises were gone. Additional treatments were given September 11, 19, 26, October 10, 23, and November 7, 1944. The patient was apparently free from symptoms of eighth nerve irritation and it was assumed that the otosclerosis was at least temporarily arrested.

Case 2. Miss A. A., age 58, music teacher, seen first March 17, 1944, complaining of loss of hearing that had come on gradually during the past five years, accompanied by a peculiar buzzing noise in her ears. Her mother had been similarly affected at about the same age and the condition had progressed to total deafness. She had been under treatment by a number of otologists, one of whom had given her pneumomassage in the external auditory canal, potassium iodide by mouth, and several forms of electrotherapy. She had received no relief. Physical and clinical examination of the patient revealed nothing abnormal except a marked scoliosis which was thought to have no bearing on the condition. The earfindings showed a normal tympanic membrane, the eustachian tube permeable to catheterization, Renne's test to be normal, and the low tones to be relatively inaudible with good perception of high tones. The patient was thought to be suffering from otosclerosis and given hypothermic therapy on the following dates: March 17, 24, 31, April 11, May 1, 4, 8, 11, 17, June 12, and July 1, 1944. She felt so much improved that she decided to discontinue treatments for a few months. Her hearing for low sounds had returned and she was able to converse with people whom she formerly could not hear. The ear-noises had disappeared. She returned for treatment October 25, November 11, and December 20, 1944, at which time she stated her hearing continued good.

Case 3. Mr. P. M., age 44, came to see me April 19, 1944, complaining of a loud humming noise in his ears and deafness. He was wearing an electric hearing device because he was a salesman and was dependent on his hearing to conduct his business. Physical and clinical examination revealed no abnormal findings. Examination of the ears revealed the tympanic membrane to be normal, the low tones to be relatively inaudible, with perception much better for high tones. The patient was thought to be suffering from otosclerosis and given hypothermic therapy on the following dates: April 19, 25, May 2, 9, 16, 1944. At this time the patient was able to dispense with his hearing device but he still had some slight ear-noises and some difficulty in hearing low tones. Treatments were repeated May 31, June 6, 13, 20, 27, July 2, 18, August 1, 8, 15, September 12, October 10, and December 5, 1944. When last in he stated he no longer had ear-noises and was able to carry on ordinary conversation without any difficulty.

ILLUSTRATIVE CASE OF DEAFNESS FOLLOWING CHRONIC OTITIS MEDIA

Miss S. P., age 28, clerk, came to see me after having consulted numerous ear specialists over a period of ten years following an acute purulent otitis media. The discharge from the ears had ceased a number of years previously, but the hearing had failed to improve despite catheterization of the eustachian tube and inflation, pneumomassage in the external auditory canal, deep heat electrotherapy, galvanism, potassium iodide by mouth, and various forms of other medications. Examination showed no unusual physical or clinical findings. Examination of the ear revealed both tympanic membranes to be essentially normal, eustachian tube permeable to catheterization, Renne's test to be normal, and low tones to be relatively inaudible with fair reception of high tones. The patient was thought to be suffering from nerve deafness possibly due to injury of the eighth nerve cochlear nerve endings from a purulent infection, followed by fibrosis. She was treated July 10, 17, 24, 31, August 7, September 11, 18, 25, October 9, 16, 26, November 16 and 24, 1944. Over this period of time the hearing gradually was restored for low tones and a disagreeable tinnitus of which she had been complaining entirely disappeared.

ILLUSTRATIVE CASES OF MENIERE'S DISEASE

Case 1. Mrs. R. M., age 37, clerk, came in with a history of running ears for eighteen years, followed by dizzy spells for fourteen years, accompanied by unconscious attacks, for three years, and loss of coordination and sense of direction for the same length of time. She had been under treatment by a number of otologists during this period, who had been successful in curing her running ears, but had been unable to give her any relief for noises in her ears and the marked loss of hearing. She was examined by me on September 9, 1944, at which time her physical and clinical findings were essentially normal. Examination of the ears revealed normal tympanic membranes, the eustachian tube to be permeable to catheterization, Renne's tests to be normal, the low tones to be inaudible, but the perception for high tones to be good. Change of position of the head caused marked nystagmus and quick change in position of the head was followed by dizziness resulting in temporary unconsciousness. Treatments using hypothermic therapy were instituted September 18, 21, 30, October 10, 14 and 21, 1944. At this time she no longer had any unconscious attacks, the nystagmus had disappeared, and she was able to bend over and straighten as rapidly as she pleased with no discomfort. Her hearing was markedly improved for low tones, and the head-noises were very markedly lessened. She was able to resume work that had formerly been impossible for her to do. She was treated again October 28, November 3, 11, 18, and December 4. At this time she seemed to be in relatively good health and complained very little of any symptoms pertaining to eighth nerve irritation.

Case 2. Mrs. C. S., age 32, came in complaining of dizzy spells, nausea, head-noises, loss of hearing and vomiting on rapid change of position. She stated she had to stay in bed until noon when she was a child, owing to severe dizziness. She had been under treatment for the condition since childhood and, when examined, claimed that she had received relatively little relief. Examination on December 1, 1944, showed essentially normal physical and clinical findings. The tympanic membranes appeared normal, eustachian tube permeable to catheterization, Renne's test normal, the low tones relatively inaudible, and good perception of high tones. The condition was thought to be a form of Meniere's disease and treatment by hypothermic therapy was instituted on the following dates: December 1, 9, 15, 24, 30, 1944, and January 4, 11, 18, 26, and February 7, 1945. The patient noted marked relief from dizziness after the first treatment and has had no nausea or vomiting after the second treatment. After the January 4, 1945, treatment she stated that the head-noises were very much lessened and she felt she could hear her associates better. On February 7, 1945, she stated her only unpleasant symptom was slight dizziness when turning quickly on her right side when lying down.

TECHNIC OF HYPOTHERMIC THERAPY

Inasmuch as a search of the medical literature and a study of the *Quarterly Index Medicus* shows no therapy

that in any way resembles my form of hypothermic means for treating disturbances of function of the eighth nerve, I shall briefly outline the instruments needed and their method of employment.

The only instruments required are those for testing hearing, tuning forks, and nasal catheter for testing the patency of the eustachian tube and an otoscope for examining the tympanum (ear drum) and the external auditory canal. An audiometer with comparative audiographs may be used to note comparative improvement over a period of time. Such were used by the author in certain instances. After thoroughly testing the ears to remove all possible etiological factors which will enhance return to normal hearing, a tube of ethyl chloride is obtained and the skin surface posterior to the external ear over the vestibular petrous portion and mastoid portion of the temporal bone is sprayed until it blanches. The skin is allowed to thaw out about one-half to one minute when the area is warmed by the hand of the operator. The procedure is repeated two or three times over each ear area. In thin-skinned individuals it is advisable to warm the skin with the hand immediately after it blanches, to prevent frost-bite. The treatment is repeated once or twice per week for a period of six to twelve treatments. If improvement is noted, the treatments are continued for a period until no further improvement is necessary. The treatments may be repeated at monthly intervals thereafter from three to six months to insure that the condition will be relatively permanent. This therapy is not presented as a panacea for all forms of eighth nerve irritation, but has been beneficial in more than 70 per cent of cases in which it has been tried in the Quisling Clinic at Madison, Wisconsin, over a period of two years.

SUMMARY

1. A method of treatment of otosclerosis, Meniere's disease, as well as other forms of eighth nerve disturbance due to disturbed blood supply and/or pressure of endolymph in the labyrinth, has been described.

2. Several illustrative cases of otosclerosis and Meniere's disease have been reviewed in which beneficial results have been noted, as well as a case of eighth nerve deafness due to an old purulent otitis media.

3. Essentially the treatment consists of freezing the skin area over the mastoid and petrous portions of the temporal bone by an ethyl chloride spray for a short period of time at intervals of three to seven days over a period of at least two months.

4. Hypothermic therapy was based on the findings: 1) that the phenomenon of paracusis Willisi could be induced by cold as well as vibratory means, 2) that there was marked sensitivity of the cochlear division as well as the vestibular division of the eighth nerve to cold, and 3) that decreased blood supply to the labyrinthine capsule will cause deafness, head-noises and dizziness.

5. The mechanism of hypothermic therapy appears to be an increase of the blood supply of the labyrinth and a varying of the pressure of the endolymph, with a resulting beneficial exchange of tissue fluids to the eighth nerve endings.

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Low Back Pain in the Army Specialized Training Program*

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IN an examination to locate the source of low back pain, it is well to bear in mind the anatomical classification. Starting with the superficial structures, the focus of the trouble may lie in: (1) the soft tissues of skin, fascia, muscle or ligaments; (2) the skeletal system; (3) spinal cord and nerves; (4) abdominal organs; (5) most deeply in the mind of psychoneurotics.

You are well acquainted with the ordinary lumbosacral sprain which is by far the greatest cause of low back pain. Other soft tissue lesions to consider are myofascitis, fibroma, lipoma, and herpes zoster. Infections and tumors of the spinal cord and nerves may produce severe low back pain. Herniation of the nucleus pulposus with irritation of the spinal nerve is now a well known syndrome. Intra-abdominally, the lesion may lie in the gastrointestinal tract, genital, or urinary organs, and by referred pain mechanisms localize the pain in the lumbosacral region. The most frequent of these conditions are intestinal adhesions, retroversion of the uterus, pyelitis, prostatic infections and tumors.

When we are satisfied that the trouble lies in the skeletal system, it is convenient to change from the anatomical to the etiological classification. This will include: (1) chronic arthritis of the spine; (2) chronic bone infections, such as tuberculosis, osteomyelitis, Charcot spine, typhoid spine, brucellosis, and fungus infections; (3) old fractures with traumatic arthritis; (4) vertebral tumors as benign osteoma or hemangioma, and malignant sarcoma or metastatic carcinoma; (5) congenital anomalies.

Next to lumbosacral sprain, the most common causes of low back pain in A.S.T.P. students were among the congenital anomalies. It was not unusual to find several different types of anomalous structure in one patient.

Spina bifida occulta has been demonstrated in 5 to 6 per cent of all spines and was the most frequent abnormality among our cases.

Case 1. B. W. is a known psychoneurotic who also began to complain of low back pain. Examination revealed a tall, slender individual with tenderness localized at the lumbosacral joint. On x-ray are seen a large spina bifida of the first sacral vertebra, and unstable lumbosacral facets.

Variations in size and plane of the lumbosacral articular facets are common. This produces a mechanical weakness that is a frequent basis for back sprain.

Case 2. P. K. W. worked five months in a factory lifting heavy truck parts and experiencing low back pain. His trouble persisted in training camp and at the university. Examination demonstrated only tenderness at the lumbosacral joint, but x-ray revealed a large spina bifida,

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and small, unstable articular facets at the lumbosacral junction. He was partially relieved with a supportive belt. These two patients were referred to an Army General Hospital and recommended for reclassification to limited service.

Elongation of the transverse process of the fifth lumbar vertebra with impingement and friction against the ilium occurred in two students.

Case 3. L. L. complained of low back pain intermittently for four months. Examination revealed tenderness in the midline at the fifth lumbar vertebra, and positive lumbosacral tests. In addition to spina bifida at the first sacral and unstable lumbosacral facets, x-ray revealed elongation of the fifth lumbar transverse process on the left side with impingement against the ilium.

Variations from the normal number of five lumbar and five sacral vertebrae were often encountered. In many cases the first sacral was separated from the other sacral vertebrae and assumed the characteristics of a lumbar vertebrae. Conversely, the last lumbar vertebra may become fused with the sacrum. All gradations from partial to total transition are seen at the lumbosacral junction. Naturally the muscular and ligamentous structures are also anomalous and low back pain results from chronic strain.

Case 4. E. L. experienced low back pain after calisthenics. The patient moved very cautiously with spine tilted to the right side and splinted by spastic lumbar muscles. Tenderness was localized at the lumbosacral joint. Straight leg raising and Lasègue signs were bilaterally positive; reflexes normal. X-ray showed the first sacral segment almost completely converted to lumbar type, unstable articular facets and spina bifida of the second sacral. The student was taped with adhesive and excused from activities for one week, at the end of which time he had obtained complete relief and returned to duty.

Case 5. R. M. noted onset of low back pain after induction into the army. This pain was intermittent and aggravated by exercise. He was relieved from activities and given diathermy treatments without benefit. X-rays then exposed transition of the fifth lumbar vertebra into fusion with the sacrum. A lumbosacral belt afforded complete relief from pain and restored the student to full duty.

Spondylolisthesis is derived from Greek terms meaning a slipped vertebra. It denotes bilateral congenital dissolution near the pedicles and anterior displacement of the vertebral body.

Case 6. D. S., an aviation student, had low back pain for six months, particularly noted upon turning flips in an airplane. He previously had been subjected to manipulations by an osteopath without benefit. X-ray revealed bilateral bone defects near the pedicles of the fifth



Fig. 1. (Case 1).



Fig. 3. (Case 3).



Fig. 2. (Case 2).

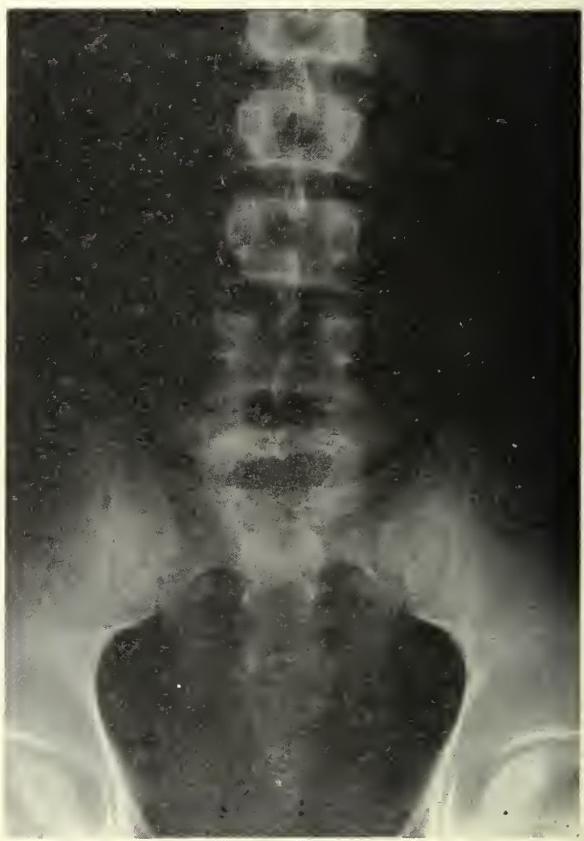


Fig. 4. (Case 4).

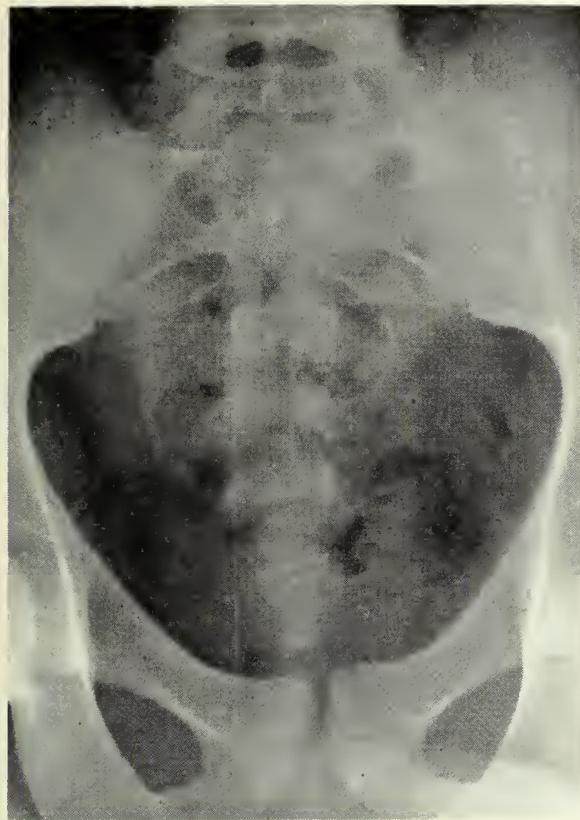


Fig. 5. (Case 5).



Fig. 7. (Case 7).

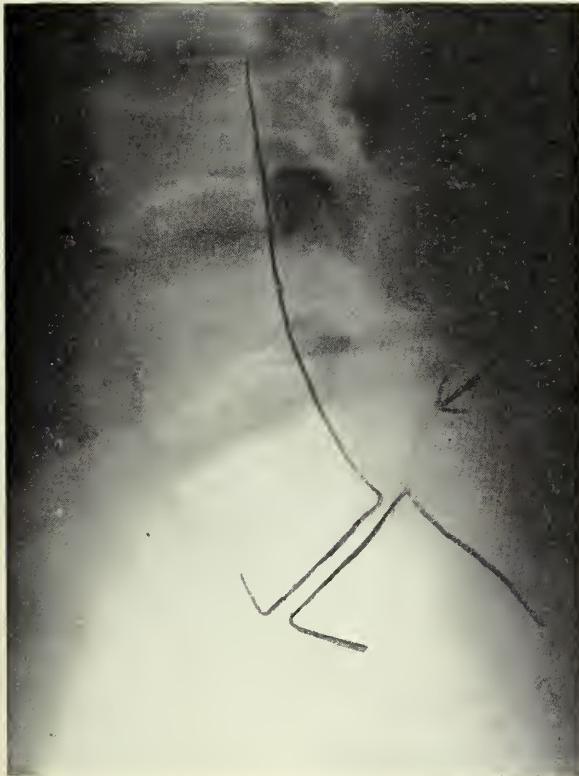


Fig. 6. (Case 6).

lumbar vertebra, with slight anterior slipping of the vertebral column.

Case 7. O. S. experienced low back pain for two years. He had noticed a depression in the midline of the lumbosacral region and this area was moderately tender. Forward bending relieved the pain, whereas extension of the spine aggravated it. X-ray showed a gross forward displacement of the lumbar spine on sacrum. These two students were transferred to an Army General Hospital with recommendations for spine fusion operations.

Conservative treatment will suffice for 80 to 90 per cent of cases of low back pain, while the remainder require operative measures. The acute sprain requires rest in an orthopedic bed, later to be given heat, massage and back exercise. The subacute case may need adhesive tape or lumbosacral support. Manipulation of the back under general anesthesia to break up adhesions, followed by immobilization in a plaster cast is sometimes indicated.

Chronic low back pain, not responding to conservative therapy is often based on lumbosacral anomalies. In several cases we have recommended limited duty status. When an elongated transverse process causes persistent low back pain, resection of the process is indicated. Pain from other congenital defects will be relieved by spine fusion. It requires six to nine months following spine fusion before a soldier is again ready for general military duty.

Spurious Fitness by the Endurance Test

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UNQUESTIONABLY the endurance test developed by Brouha¹ and his colleagues has at last provided a technic most suitable for mass testing. Moreover, a man can test himself, since he can easily learn to count his own pulse. A whole gym class can test itself in a single hour period, one-half counting the pulse for the other half, then turn about. If such a procedure is widely pursued, it will soon dispel much of the myth that has accumulated about tests of physical fitness. There is no difficulty in counting one's pulse for a 30 second period with an accuracy of 1 per cent, so the score, which is 100 times the ratio of the number of ascents to the sum of three such counts, should reproduce to better than 2 per cent. Therefore scores can differ by more than a unit or two only because of real variations in the man himself, whatever their cause. One of us has accumulated over 70 tests on himself over a period of fifteen months. In the process we have run upon an interesting instance of an increase in score when physically least fit.

After eight preliminary tests over a period of five months, a series of tests was commenced under standard conditions every possible working day; but after twenty-three days, and 13 tests, they were interrupted by a mild attack of influenza. Ten days later, when the tests were resumed, the score had risen from a median of 66 before the attack to 83 after, contrary to expectation. In fact,

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¹L. Brouha: The Step Test: a Simple Method of Measuring Physical Fitness for Muscular Work in Young Men, Research Quarterly, Am. Assn. Health, Phys. Ed. & Rec. 14:31-35, 1943.—J. R. Gallagher & L. Brouha: A Simple Method of Testing the Physical Fitness of Boys, same, pp. 23-30.—Harriet L. Clarke: A Functional Physical Fitness Test for College Women, J. Health & Phys. Ed. 14:358-9, 394-5, 1943.

the last tests before gave 66, 60, 52, showing the approach of the infection while the postinfluenza tests gave 83, 73, 62, 71, 66, 67, 65, etc. The reason for this was quite apparent, namely, pairs of slow beats, the result of powerful vagal stimuli, beginning about a minute after the exhausting exercise, and lasting for over a minute. Indeed, a continuous electrocardiogram revealed eight sino-auricular blocks between 1 and $1\frac{1}{2}$ minutes, eight in the next half-minute, four in the next, and none thereafter. A sample pair is shown in figure 1.

Now athletes usually have strong vagus tone, which explains their slow pulse, and so vagaries in the pulse score for the endurance test can be expected. For every slowing of the pulse lowers the count and raises the score. But while the normal effect of training is thus to raise the score, not every increase can be considered an improvement. Interpretation must be tentative and cautious.

Another example of the limitations of the pulse score was provided by the captain of the swimming team. His median score (5 tests) was 112, low 109, high 126. There was nothing in his athletic performance to explain the increase of 17 in score. His blood pressure responses, however, seemed to provide the answer, for they were best when his score was worst, and vice versa. Thus, with pulse score 109, his pressures immediately after exercise were 160/60, while they were 222/40 when his pulse score was 126. Another swimmer showed a pulse score of 112 under basal conditions, just out of bed in the morning. This was 21 above his previous test, non-basal, with no great difference in the blood pressure responses. Evidently one must pay attention to all the circumstances. Under the most favorable conditions the median deviation of individual tests from the median score for the man is better than 4 per cent. For mass and self-testing

Table 1
Q-T Interval Before and After the Endurance Test

Subject No.	Age (years)	Score	Exhausting Exercise	C = R-R	Q-T	k						
						0.7	1	K	2	3	10	
1	54	57	Before ¾ min. After 10 min. After	1.38	.44	.377	.376	.367	.359	.319		
				.46	.29	.400	.388	.354	.329	.249		
				.85	.38	.394	.400	.372	.358	.294		
2	19	80	Before 1 min. After	.64	.32	.376	.368	.346	.329	.263		
				.40	.28	.417	.401	.347	.331	.244		
3	19	112	Before 4 min. After	1.09	.41	.385	.381	.369	.359	.310		
				.75	.36	.394	.388	.368	.352	.290		
4	20	106	Before 1½ min. After	.92	.40	.407	.397	.381	.368	.312		
				.52	.33	.428	.416	.385	.361	.279		
5	19	93	Before ¾ min. After	.88	.36	.365	.363	.348	.336	.283		
				.46	.30	.414	.401	.366	.341	.258		
						.394	.388	.367	.352	.283		
Median (11 values)						3.9	3.3	3.1	3.5	7.5		
Average Deviation (%)						3.7	3.1	1.0	1.3	6.2		
6	45	83	2¾ min. After 12 min. After	.50	.31	.410	.398	.367	.343	.263		
				.58	.33	.406	.396	.370	.349	.275		

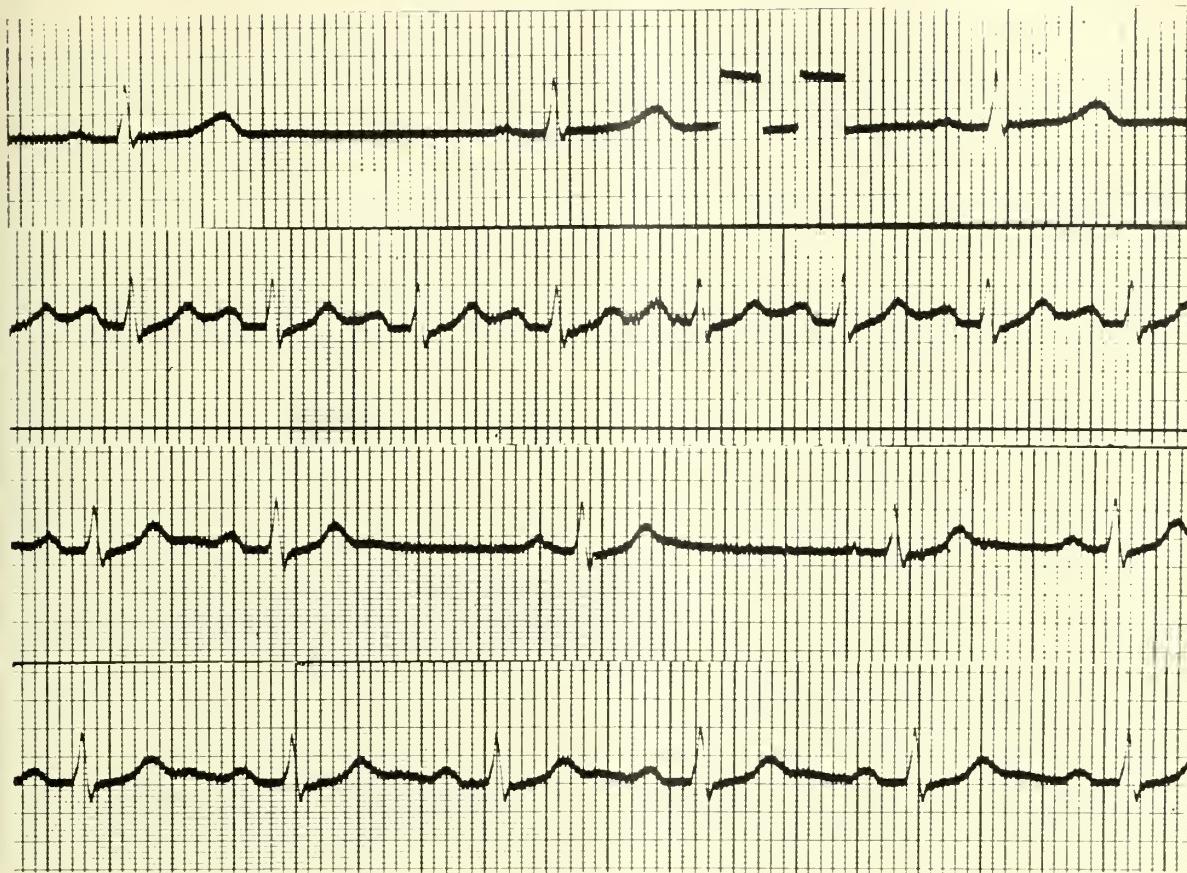


Fig. 1.

Top electrocardiogram: At rest, recumbent, before exercise. Rate regular. Second ecg.: $\frac{3}{4}$ min. after 75 ascents (18 inch step) in 150 seconds. Rate regular. Third ecg.: 1 min. 20 sec. after exercise. Eight S-A blocks per minute, in pairs. Bottom ecg.: $2\frac{1}{2}$ min. after exercise. Rate regular. (All four are Lead II).

this score is about all that is practicable, but for a complete picture both the blood pressure and electrocardiographic responses should be added.

Incidentally, we have found no evidence that there is any systematic change in the repolarization process in heart muscle after this exhausting exercise in healthy men. For the Q-T interval of the electrocardiogram fits Ashman's² empirical formula (Q-T) = .367 log (10c + 2), both before and after exercise, as shown in table 1. C is the cycle length (R-R) in seconds. One must be cautious not to ascribe to age or to exercise, etc., changes in K which may be due really to a wrong choice of k.

The top row for each man in the table gives individual median values before exercise, and the rows under it, those after exercise. Apparently, each man has his own individual characteristic K, which is slightly different from that of the others. One k, however, for all five

²R. Ashman: The Normal Duration of the Q-T Interval, Proc. Soc. Exp. Biol. & Med. 40:150, 1939.

produces such constancy in the K for each man that it can hardly be accidental. In the two bottom rows are added results after the exercise on a physical educator 45 years of age who accomplished the 150 ascents in 5 minutes (18 inch step). This is probably too much for a man of that age (No. 1 could only accomplish 90 ascents in 3 minutes), but there is no evidence in his constants that recovery after exercise is delayed in the heart muscle.

SUMMARY

It is shown that the pulse score in the Endurance Test can increase, not only because of fitness, but also spuriously because of increased vagus tone. This score should be supplemented by blood pressure and electrocardiogram responses, to complete the picture. The latter give no indication that repolarization in the heart muscle is delayed after this exhausting exercise, in the six men studied.

When you buy 7th War Loan Bonds for your boy's medical education, if you buy enough to pay for 3 years, Uncle Sam treats you and him to the fourth.

Ringworm of the Scalp*

(*Tinea Capitis*)

Francis W. Lynch, M.D.†

St. Paul, Minnesota

MOST medical practitioners are unprepared to give proper care in the present—as yet minor—epidemic of ringworm of the scalp. Previous to the past several years there has been no need for local practitioners to be familiar with the problem because only a few examples of ringworm of the scalp were presented for diagnosis and treatment and they were all of one type, i. e., acquired from cattle, easily recognized and easily treated. Other types were recognized as they appeared as sporadic cases in eastern cities of the United States and in fairly well localized epidemics or in endemic form in Europe, where widespread epidemics were occasionally observed. The present epidemic in the United States began on the eastern coast about five years ago and has gradually extended south and west. Infection appeared in Chicago four years ago, where the epidemic has been poorly handled and there the estimates of incidence now vary from 5,000 to 65,000 cases. The first cases were recognized in St. Paul several years ago but only in the past year have they increased in number to the point where the Minnesota Dermatological Society was impelled in November, 1944, to call to the attention of public health authorities, the danger of an impending epidemic. Today St. Paul probably contains between 150 and 500 cases of the disease, more thus far than in other cities of Minnesota.

Previous experience in this community has been limited to a moderate number of cases of infection with *T. gypseum*, usually acquired from infected cattle, and occasional infections with other organisms, sometimes those from infected kittens. In the present epidemic almost all patients are infected with *M. Audouini*, and a few with *M. lanosum* (synonyms: *canis*, *felineum*). The organisms can be demonstrated by direct microscopic examination of infected hair properly treated with sodium or potassium hydroxid solution. Such examination can prove the presence of ringworm infection, but for demonstration of the exact cause this method is unsatisfactory. When infected hair is implanted on proper media the organisms grow rapidly and can usually be identified by the gross appearance and more certainly on microscopic study of the colonies. The simplest method of distinguishing between infections caused by *T. gypseum* and those caused by *M. Audouini* or *lanosum* is that of examination by Wood's light (ultraviolet light made invisible by a filter which excludes the rays of visible light), a light that produces fluorescence of hair infected with these two species of microsporum.

When ringworm of the scalp is the result of microsporum infection, visible evidence of disease may be absent until the scalp is examined in "dark light" and flu-

orescence is demonstrated. When infection is more severe there is a fine scaling, accompanied by few or no papules when caused by *M. Audouini*; if caused by *M. lanosum*, slightly more scale is noticed and small papules are usually present. The hair may be lusterless and brittle with varying amounts of loss in the involved areas. Infection with *T. gypseum* results in grouped inflammatory papules with or without crusting; when this infection is severe it produces kerion, a rather indolent cellulitis with small abscesses. (This is occasionally observed also in infections caused by *M. lanosum*). The degree of involvement varies. One or many sites may be affected and these may vary from several hairs to spots several inches in diameter. Not infrequently the infection extends to non-hairy areas; in the severe cases hypersensitivity may result in production of a more or less generalized "id" eruption. Because of the extensive variations in clinical manifestations, for a differential diagnosis almost all those disorders of the scalp accompanied by superficial or deep inflammation and those causing loss of hair must be considered.

Source	<i>M. Audouini</i>	<i>M. lanosum</i> (<i>felineum</i> , <i>canis</i>)	<i>T. gypseum</i>
human	pets, human	cattle	
Clinical inflammation surface kerion	v. fine scale rare	scale occasional	+++ crust common
Course	v. chronic, to puberty	chronic	subacute
Diagnosis direct exam. of hair fluorescence culture	+	+	+
	+	+	micro*
gross*	gross*	gross*	
Response to treatment	epilation necessary	slow	self-limited

*The two strains of microsporum can usually be distinguished by gross examination of the colonies. Trichophyton colonies can usually be recognized grossly but microscopic study is more conclusive.

Infection with *M. Audouini* is very resistant to treatment by applications, in fact, in the majority of cases it cannot be cured by topical applications of any known type but will persist until puberty, then disappear spontaneously without trace. This infection is best treated by a single roentgen treatment sufficient to produce temporary loss of at least 85 per cent of the scalp hair. Later periodic examination in dark light permits detection and manual removal of any remaining infected hair; infected areas are treated with mildly fungicidal remedies. Infection with *M. lanosum* is self-limited; it is treated without x-rays or complete epilation but with the other remedies mentioned above. It is said that three to six months are required for cure. Infection with *T. gypseum* is more acute and is also self-limited. Effort should be made to

*Read before the Ramsey County Medical Society meeting, St. Paul, April 30, 1945.

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minimize the development of kerion which may heal with areas of permanent scarring and alopecia.

For this brief presentation I have avoided discussion of several problems which are interesting but not immediately germane to the subject. 1) Much work is being done with new improved fungicides but as yet there is not one on the market which is successful against infection with *M. Audouini*. 2) Temporary epilation results from administration of thallium acetate but the drug can cause death, and it should be used only by experts, with the patient in the hospital. This treatment may be justified under the right conditions when roentgen epilation has failed. 3) Because of the favorable influence of adolescence both topical and parenteral endocrine therapy have been tried but without very encouraging results. 4) Since infections caused by *M. lanosum* can be acquired from household pets, it is interesting to speculate on the reason for an increased number of these cases during an epidemic caused chiefly by *M. Audouini* which is spread only from child to child.

The responsibilities of the general practitioner cannot but be somewhat limited in the presence of ringworm of the scalp. He may suspect the diagnosis and exclude

such children from school, but since clinical features are not completely characteristic the diagnosis must be aided by special facilities. Examination in filtered ultraviolet light will demonstrate fluorescence of hair infected by *M. Audouini* or *lanosum*; cultural study allows differentiation between these two types of infection. If caused by the former organism the infection should be treated by roentgen epilation; infections with the latter organism will respond slowly to topical therapy. In either case there must be repeated examinations with manual removal of any hair which fluoresces even though the scalp appears to be free from scale or inflammation. No child may be regarded as cured while fluorescence persists. In treatment there are several warning points that should be emphasized: Before epilation the use of topical applications is not only a waste of time, but unless the applications are very mild the irradiation must be delayed until any reaction has subsided. Inadequate or fractional dosage with x-rays is also to be decried because all these exposures have cumulative and permanent effects and an epilation dose can not be administered after any considerable amount of previous roentgen treatment has been given.

Book Reviews

Forsdike's Textbook of Gynaecology, by J. H. PEEL, M.A., B.M., B.Ch. (Oxon.), F.R.C.S. New York, Grune & Stratton, 440 pages, 1944, price \$3.00.

This book is a concise presentation of gynecology. The student willing to do extra reading on special subjects will find it useful. Rare and unusual conditions are not fully covered and therefore the volume is not so useful for the general practitioner as a reference book.

The microphotographs are generally poor, showing little detail. Many of the drawings are excellent, especially those marked S. A. Sewell.

It is practically impossible to publish a text that is not outdated in some of the rapidly changing therapeutic measures. This is true in respect to the therapy of sulphonamides and penicillin in this volume.

It is of interest that the author recommends for postoperative vomiting a small stomach tube left in place for repeated lavage but does mention nasal suction.

In the treatment of carcinoma of the cervix the Wertheim operation is advised in selected cases. Radium treatment of this disease is carried out first and is followed by deep x-ray therapy three months later.

This volume will be useful for those who wish to go over a gynecological subject rapidly without being burdened by much detail.

Textbook of Gynecology, by EMIL NOVAK, M.D., F.A.C.S. Baltimore, Williams & Wilkins Co., 708 pages, 1944, price \$8.00.

This is a satisfactory textbook for the student and general practitioner. It is well illustrated both in color and in black and white. The illustrations are carefully chosen and consequently most instructive. The author has purposely omitted the descriptions of the technics of the various gynecological operations. These should be learned in the operating room and by reference to the several excellent books on the subject.

The author has worked for many years in the pathological laboratory. He has used this interest to good advantage in presenting the gynecological pathology and the excellent illustrations further enhance the value of his descriptions.

Female endocrinology is discussed at length. The author's well known interest in this subject has led him to give more space to the various opinions of others than perhaps is justifiable in a book for medical students.

A new chapter on embryology of the female generative organs has been added to this second edition. In this edition also is a new chapter on urological diseases of especial interest to the gynecologist written by Houston S. Everett.

This is a well planned book and the subject matter is presented most satisfactorily.

Mass Radiography of the Chest, by HERMAN E. HILLEBOE, M.D., Medical Director, Chief, Tuberculosis Control Division, U.S.P.H.S.; Professorial Lecturer on Tuberculosis Control, George Washington University; and RUSSELL H. MORGAN, M.D., Medical Officer-in-Charge, Radiology Section, Tuberculosis Control Division, U.S.P.H.S., Assistant Professor of Roentgenology, University of Chicago. 288 pages, 93 illustrations. Chicago: The Year Book Publishers, Inc., 1945, Cloth, \$3.75.

Appearing just as both lay and medical eyes are being focused on miniature x-ray film methods of detecting pulmonary tuberculosis, this book presents in detail both the technical roentgenologic and the procedural data necessary for such work.

After first describing the history of mass radiography from the discovery of the x-ray to the present moment, the authors discuss the basic objectives of tuberculosis control, and then present the actual modus operandi of mass radiography in any community. In these chapters case-finding, medical care, patient isolation, and rehabilitation of the tuberculous are integrated with the responsibilities of health departments, local medical societies, sanatoria, voluntary tuberculosis associations and local welfare agencies.

All of the multitude of technical questions regarding roentgenologic features of such work are answered in the intermediate chapters of the book. Available equipment, installation designs, physical factors affecting equipment selection and the advisable technic in mass radiography are all given detailed consideration in these chapters.

One chapter which will appeal to the roentgenologist, the internist, and the general practitioner is that on roentgen diagnosis of the chest. With 47 instructive x-ray film reproductions the roentgenologist will find testimony of the effectiveness of such miniature x-ray films, and clinicians will have an effective atlas or aid in differential diagnosis of thoracic pathology.

Then follows, through three chapters, minute descriptions and discussions of the records, filing systems and procedures in actual mass radiography work, as well as the necessary study or care of persons found to have significant lesions. In its final chapter this book intriguingly portrays the future developments in the field of roentgenology and mass radiography.

This volume, even though small, much more adequately covers its field and need than any work previously produced. It is pleasingly written and easy to read. Based as it is on years of experience in such work, it is the complete answer, concisely presented, to the most inquiring and critical medical antagonists and protagonists of mass radiography.

Yellow Magic—the Story of Penicillin, by J. D. RATCLIFF, with a Foreword by CHESTER KEEFER, M.D., and an introduction by MORRIS FISHBEIN, M.D. New York: Random House, 173 pp. with index, 10 photographs, 1945, price \$2.00.

The discovery of penicillin belongs with those outstanding events in medical history each of which marks an epoch and determines the nature of medical progress for at least a generation, Dr. Fishbein says in his introduction. It is probably the most important medical discovery in modern times; it is certainly one of the most exciting and dramatic in the long history of man's fight against disease. Mr. Ratcliff has permitted none of the drama to escape him and as his story unfolds few readers will be able to withstand his enthusiasm.

All of us are familiar with the sensational cures of this by-product of the humble mould, but too few know the details of its finding—the grueling research handicapped by almost fantastic difficulties, the big disappointments and little successes, the unique collaboration among scientists, industrialists and government executives that in a few months made possible the miracle of its mass production.

In his book Mr. Ratcliff traces the story back to its origin in the '20s, to Fleming's simple laboratory at St. Mary's, to the day when a speck of mould floated into his window and lighted on one of his petrie dishes. The shy, quiet English scientist had the wit to study the contaminated plate and in 1929 published his paper describing the antibiotic action of the mould which he mistakenly labeled Penicillin rubrum. (It was actually *P. notatum*). But so minute was the quantity of the precious drug yielded by great quantities of mould that for ten years it was almost forgotten. Then Dr. Florey who had been working des-

perately in similar fields, rediscovered Fleming's article and in 1941 treated the first case. England was too busy that year to give time or money to a drug, so Dr. Florey and his associate, Dr. Heatley, came to America to "sell" penicillin here. So successful were they that government bureaus and drug houses together agreed to gamble millions of dollars for its production with the result that a mushroom growth of great plants sprang up almost overnight and began to grow the mould and extract the drug before they had roofs to cover them. Three years ago there was not enough penicillin in the world to treat a single patient adequately; today we have not only enough for our army and navy and civilians but soon we shall be providing 95 per cent of that used by the entire world. Much of the credit of this achievement is due Dr. Chester S. Keefer under whose direction the brilliantly organized clinical study was carried on.

Such is the bare outline of the story that Mr. Ratcliff tells, enlivened with details of the plot and with convincing portraits of the heroes. He has devoted careful preparation to his book. He has personally conferred with all the groups concerned. Both Dr. Fishbein and Dr. Keefer attest to the soundness of his presentation. He writes in a vivid, highly readable style that challenges the interest of the reader throughout, be he layman or physician.

Clinical Roentgenology of the Digestive Tract, by MAURICE FELDMAN, M.D.* Second edition. Baltimore: Williams & Wilkins Co. 769 pages; illustrated. 1945, price \$7.00.

Other books have been published in recent years which have described and explained the roentgen investigation of all or parts of the digestive system, but none, since Carman's 1917 and 1920, has been as inclusive as Feldman's work, first issued in 1938 and now revised and brought up to date. This single volume is an encyclopedia of abdominal diagnosis. The material is presented in outline form; although printed in conventional manner. The division into sections, with numerous sub-headings and the simple, direct sentence structure offers the advantages of a synopsis with the inclusion of comprehensive detail and the merit of readability. The abundant and pertinent references are conveniently interpolated in the text, obviating cumbersome footnotes and appendages. Line drawings and sketches aid in interpretation of many of the excellent reproductions of well-chosen roentgenograms. Explanation of technical matters is not extensive, but is sufficient for instruction of readers not trained in roentgenology or gastroenterology. The point of view is strictly clinical, based obviously on sound observation and experience.

* (Feldman: Asst. Prof. Gastroenterology, U. of Maryland; Asst. in Gastroenterology, Mercy Hospital, Baltimore; Consulting Roentgenologist, Sinai Hosp., Baltimore.)

FEDERATION OF CATHOLIC PHYSICIANS' GUILDS

The Reverend Alphonse M. Schwitalla, S.J., president of the Catholic Hospital Association of the United States and Canada, dean of the St. Louis University school of medicine, will assume the moderatorship of the Federation of Catholic Physicians' Guilds, and the editorship of the federations' journal, the *Linacre Quarterly*, after the meeting of the executive board. Father Schwitalla succeeds the Reverend Ignatius W. Cox, S.J., professor of philosophy, Fordham university, New York City, both as moderator of the federation and as editor of the *Linacre Quarterly*. Father Cox is author of numerous papers on the ethical and religious aspects of medicine. At the present time there are Guilds in New York, Brooklyn, the Bronx, Boston, Belleville, Chicago, San Francisco, Little Rock, Wichita, New Orleans, Cleveland, Philadelphia, Great Falls, Dubuque, Wilmington, St. Louis, Newark, Detroit, and in Hamilton, Canada. In the business management and administration of the Federation, the Catholic Hospital Association will act as agent on behalf of the Catholic Physicians' Guilds. The *Linacre Quarterly* from its inception in 1932 has been the only journal of its kind in the country, having as its purpose the preservation of ethical and spiritual values in the practice of medicine, particularly among Catholic physicians.

American Student Health Association News-Letter and Digest of Medical News

EXERCISE AND CONVALESCENCE

Dr. C. H. McCloy of the University of Iowa calls attention to the importance of physical exercise for the hospital patient. When a patient goes to a hospital, especially when he is immobilized for some time, he tends to retrogress rather rapidly. A patient in excellent condition retrogresses even more rapidly. It has been found by experimentation in the physiological laboratory that an individual capable of enduring 18,000 kilogram-meters of work in a given time without rest, after two weeks' inactivity in which time he is walking around but doing no other exercise, will retrogress until he has the ability to do only 8,000 kilogram-meters of work in that time.

A well-conducted and long-continued experiment at Jefferson Barracks, in St. Louis, by Lieut. Colonel Rusk and Captain Erickson, on cases of atypical pneumonia has provided clear-cut evidence of the value of exercise programs in the reconditioning of these patients. There were two series of these patients distributed in alternate groups. One group was permitted to stay around the hospital with very little attempt at reconditioning, just as has usually been the practice in civilian life. The other group, which may be called the experimental group, was started on gentle exercise after the sedimentation rate had reached 10 mm. in thirty minutes. The exercise was then very rapidly increased in severity from day to day. The non-exercise group remained in the hospital an average of forty-five days and after going back to duty exhibited a 30 per cent relapse. The experimental group which went through the reconditioning program spent an average of thirty days in the hospital with a relapse rate of only 3 per cent. In other words, they saved fifteen days' hospitalization and had 27 per cent less incidence of relapse.

Due care must be exercised, of course, to see that individual differences in condition, either due to the severity of the illness or to the initial physical condition of the man, are allowed for and taken fully into account in the prescription of exercise for each man.

Reference. McCloy, C. H.: "The reconditioning of patients," Bulletin of the U. S. Army Medical Department, 23-24, (No. 79), August 1944.

ALCOHOLIC THIRST

Giorgio Lolli, M.D., Miriam Rubin, B.S., and Leon A. Greenberg, Ph.D. of Yale University point out that it has long been observed that thirst is one of the features of acute alcoholic intoxication as well as of the so-called "hang-over" period. And it has long been suggested, but without any valid basis, that alcohol, through its affinity for water, "dehydrates" the body. Dehydration of this type is not exercised upon the cells by alcohol in the concentrations found even in deepest intoxication. The existence of the thirst, however, does suggest either a con-

siderable loss of water from the body or a redistribution of water in the body.

The present investigation was carried out to explore the possibility that a shift in water, over and above that from diuresis, takes place from the intracellular to the extracellular fluid. Rats were used as the experimental animals throughout. Before studying the effect of alcohol, the normal volume of extracellular water was determined in 16 rats receiving food and water freely and in 7 rats deprived of food and water for twenty hours before the determination.

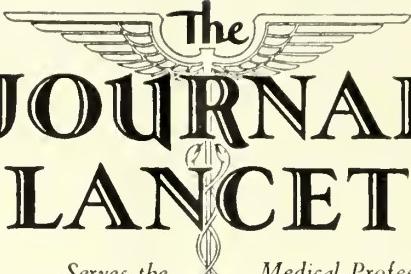
Two groups of animals, one receiving food and water freely and the other deprived of these for twenty hours previous to the experiment, were given alcohol in 50 per cent solution by stomach tube. In both groups there was an increase of extracellular fluid. The rise was much greater in the animals that had received food and water. Thus, at four hours the extracellular fluid had increased to an average of 43.1 per cent in the fed animals and to 33.6 per cent in the fasted animals. There was a subsequent decline in the volume of fluid. At twenty hours, however, when alcohol was no longer present in the blood, a time corresponding to the period of "hang-over," a second appreciable rise in the volume of extracellular water was observed; the average for the fed animals was 40.5 per cent, and for the fasted animals, 35.3 per cent.

The maximum increase of extracellular water occurred at the end of two hours, with no second rise after twenty hours.

Alcohol given either by stomach or intravenously, to fed or fasted animals, resulted in a marked shift of water from the intracellular to the extracellular spaces. That such a shift can be a major factor in the production of thirst during and after alcoholic intoxication seems probable. The term "dehydration," as generally applied to the physiological effects of alcohol, can be more specifically defined as a dehydration of the cells and not of the body as a whole.

Reference. Lolli, Giorgio, Miriam Rubin and Leon A. Greenberg: "The effect of ethyl alcohol on the volume of extracellular water," Quarterly Journal of Studies on Alcohol, 5:1-4, (No. 1), June 1944.

Colonel H. K. Moore, chief of the meat and dairy hygiene branch, states that the veterinary corps is inspecting over 700 million pounds of foods of animal origin per month. The armed forces require each day about 19,000 cattle, 27,000 hogs, 600 calves and 5,000 sheep and lambs—all of which must be inspected to insure that it complies with army specifications as to weight, class and grade, method of processing and packaging. Not a single widespread outbreak of disease traceable to unwholesome meat or dairy products has occurred among our troops.



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HOME NURSING HELPS

The American Red Cross has been organizing a great number of free courses in "Home Nursing" throughout the country and up to the present more than one and a quarter million certificates have been issued to those who have taken the standard twenty-four-hour or the new twelve-hour course designed to cover only the basic procedures in home nursing for hard-to-reach adult groups. The students are definitely told that attendance at these classes does not make of them nurses nor are they being taught to supplement the doctor, but they are instructed:

"How to recognize the most common signs of illness."

What information to give the doctor when he is called.

How to carry out the various procedures which he may recommend.

How to take a temperature and to read a thermometer.

How to give an enema.

How to bathe and handle a bedfast patient with the least disturbance and effort.

Bedmaking.

Methods of keeping proper records for the doctor's information.

Methods of disposal of excreta and handling of contagious diseases within the home when necessary.

Preparation of proper diets for the patient.

Understanding of public health problems."

The goal is to reach, if possible, one person in every household in America. The purpose is to make every citizen health conscious. It will serve this purpose in the present emergency and also assure intelligent cooperation with physicians and nurses in the future.

A.E.H.

POST-WAR PLANNING FOR HOSPITALS

Amid the confusion of post-war planning and reconverting, nothing seems more certain than that the nation, from Congress down, will emerge from the war more health conscious than ever before in its history. One thing seems fairly established. New hospitals and health centers will hold a leading place in federal plans to assist communities to raise their health standards. It is equally certain that to obtain federal aid for a hospital a community will be required to share the financial responsibility and also to prove that the new hospital it wants will meet established standards of construction, equipment and medical support. The staffs of these hospitals will be the final determining factor in their efficiency. The doctors concerned must be the ablest medical men in the community. State health departments, medical societies—state, district and county—and the most enlightened members of the community, must work in the closest cooperation to this end.

The experience of some states suggests that it is not too early to start such a cooperative group in the education of the public and its officials. In many states it may prove necessary to pass new bills or to amend old ones to permit communities to sell bonds for hospital purposes. These bills may well provide the opportunity for all manner of irregular "practitioners" to get a foothold, unless governors, legislators and the public are wide awake to the significance of their wording.

M.U.

... AMONG OUR CONTRIBUTORS ...

Among the varied and human pleasures of medical publishing not the least is the one that concerns our contributors,—their educational backgrounds, their personalities as revealed by their writings. That our readers may share this pleasure with us is the reason for these brief notes.

Dr. Ralph E. Leigh (Grand Forks, North Dakota), who contributes the introduction to this symposial issue, is the president of the North Dakota Society of Obstetrics and Gynecology, and served previously as its secretary. He received his bachelor of medicine degree from the University of North Dakota in 1923 and his doctor's degree from Minnesota, two years later, beginning his practice of obstetrics and gynecology at Grand Forks after two years of graduate work at Kings County hospital, Brooklyn, New York. Dr. Leigh is a fellow of the American College of Surgeons.

Dr. Edward Madison Ransom (Minot, North Dakota), a past president of the North Dakota Society of Obstetrics and Gynecology, was the incumbent four years ago when THE JOURNAL-LANCET was appointed the society's official organ. He is a graduate in the class of 1904 of the University of Minnesota medical school, with certification by the American Board of Obstetrics and Gynecology and is a member of the Central Association of Obstetricians and Gynecologists. Dr. Ransom has practiced in Minot for thirty-seven years.

Dr. Bernard Urenn (Fargo, North Dakota) was graduated from the University of Minnesota medical school in 1934 after which he spent three years in preparation of his specialty, gynecology and obstetrics and as a teaching fellow. He has practiced nearly eight years in Fargo and is an active member of both Minnesota and North Dakota state medical societies and of the North Dakota Obstetrical society. He is also a member of the honorary medical society Alpha Omega Alpha.

Dr. Wilbert Ashton Liebeler (Grand Forks, North Dakota) received his medical training at the University of Illinois, his graduate work at the Cook County hospital of Chicago and the Milwaukee General. He specializes in surgery. He is a F.A.C.S., a member of the International College of Surgeons, and of state and local medical societies. He has served as both president and secretary of the district medical society.

Dr. Harry Roemer McPhee (Princeton, New Jersey) has specialized for 17 years in student health work at Princeton university, where he is associate professor of health and physical education, athletic physician and the head of student health work. He has also served as president of the Pennsylvania-New Jersey student health association. Dr. McPhee spent two years with the A.E.F. in the medical corps during the last war. His medical training was received at Western Reserve university.

Dr. Philip Varnum Wells (Newark, New Jersey) is a biophysicist of the Prudential insurance company and is known to physicists as the designer of the flarimeter for tests of the circulation and for his numerous papers on physics and biophysics. After receiving his bachelor of science degree at the Massachusetts Institute of Technology, he studied at the University of Paris, France, where he received his doctorate in science. For nine years thereafter he worked at the Bureau of Standards at Washington, D. C. He is a member of numerous scientific societies among which are the American Physical Society and the American Statistical Association.

Dr. Sverre Quisling (Madison, Wisconsin) is a graduate of Rush medical school of the University of Chicago and was in the class of 1922. He specializes in internal medicine for which he prepared at the University of Pennsylvania graduate school of medicine, at Columbia university, Wisconsin and Vienna. He is a member of state and local medical societies and a fellow of the American Medical Association. He is also a diplomate of the national board of medical examiners and belongs to the honorary society Sigma Sigma.

Dr. Leonard J. Stark (Cincinnati) is an instructor of orthopedic surgery at the College of Medicine in that city, in which community he has practiced his specialty of orthopedic surgery for a year. His alma mater is the University of Louisville from which he graduated in 1939, after which he took graduate work at the University of Pennsylvania and Cincinnati general hospital. Dr. Stark holds membership in the Academy of Medicine of Cincinnati and has been honored by Alpha Omega Alpha.

Dr. Francis W. Lynch (St. Paul) graduated in medicine from the University of Minnesota in December, 1929 and has, also, a master's degree in dermatology and syphilology from the same institution. He spent 1930, 1931, 1932 and 1933 in graduate work at this school, entering practice in St. Paul at the end of that period and specializing in dermatological and syphilological work. His memberships include the American Dermatological association, American Academy of Dermatology and Syphilology and the Society for Investigative Dermatology. In addition he is a member of the honorary fraternity Sigma Xi.

"SOCIAL SECURITY AMENDMENTS"

May 24th, Senator Robert F. Wagner of New York, with Senator Murray, introduced Senate Bill S 1050, providing for "the national security, health and public welfare." Simultaneously, Representative Dingell of Michigan introduced a companion bill, HR 3293, in the House. The legislators invite the earnest study by doctors of the provisions of the bill, stating that there is no intention on the part of the authors to "socialize" medicine, and that the bill does not do that. They say that they are opposed to socialized medicine or to State medicine and acknowledge having been benefited greatly from the constructive advice and suggestions of practicing physicians in preparing the bill which, they say, is changed materially from the one they presented in the last congress.

News Items

The regular convention of the North Dakota state medical association was cancelled for this year, but the council and house of delegates met in Valley City on May 20 and 21. The main subject discussed was the prepaid medical insurance plan, which had been prepared by the committee on medical economics. There was no scientific program. Dr. James F. Hanna of Fargo was elected president, A. E. Spear of Dickinson, president-elect; P. G. Arzt of Jamestown, first vice president; W. A. Liebeler of Grand Forks, second vice president; John H. Moore of Grand Forks, speaker of the house; L. W. Larson of Bismarck, secretary; W. W. Wood of Jamestown, treasurer; A. P. Nachtwey of Dickinson, AMA delegate, and W. A. Wright of Williston, alternate. Minot was selected as the 1946 convention city. Councillors elected, terms expiring 1948, were A. D. McCannel of Minot, Fourth district; C. J. Meredith of Valley City, Fifth, and A. E. Westervelt of Bowdon, Ninth. Nominated to the state board of medical examiners were W. H. Long of Fargo, F. W. Ferguson of Kulm and O. W. Johnson of Rugby. John H. Moore of Grand Forks was nominated to the Advisory Council for the medical center at Grand Forks. About forty attended the convention sessions.

The two-day annual meeting of the North Dakota hospital association was held in Bismarck, on May 9 and 10. Dr. George F. Campana, state health officer, spoke on the Emergency Maternity Infants Care (EMIC) program in the state. The program included discussions of postwar problems and of U.S. SB 191, dealing with allocations of funds to hospitals.

The North Dakota Society of Obstetrics and Gynecology held its semi-annual meeting Saturday, May 26th, at the Gardner Hotel in Fargo, North Dakota. The following program was presented: "The Rh Factor in Pregnancy," Dr. F. L. Schade, Worthington, Minnesota. "Case Report—Erythroblastosis Foetalis," Dr. E. H. Boerth, Buffalo, North Dakota. "External Version," Dr. Paul Freise, Bismarck, North Dakota. "Amnion Fluid Embolism," Dr. Russell Moe, Duluth, Minnesota. "Case Report—Postpartum Mesenteric Thrombosis," Dr. Wm. Mercil, Crookston, Minnesota. "Radium in Menopausal Bleeding," Dr. Robert Woodhull, Minot, North Dakota. "The Pre & Intra Partum Use of Ergot," Dr. C. J. Ehrenberg, faculty of University of Minnesota Medical School, Minneapolis. The list of new officers is as follows: President, Dr. E. H. Boerth, Buffalo; vice president, Dr. Paul Freise, Bismarck; secretary-treasurer, Dr. G. Wilson Hunter, Fargo. Following the evening banquet, the society was entertained by Dr. Frank Darrow, past president of the North Dakota Medical association with feats of magic and legerdemain.

Dr. M. R. Snodgrass, Anaconda, Montana, has been appointed chief of surgery at the Warren clinic located at Michigan City, Indiana.

The ODT would not permit the holding of the regular meeting of the South Dakota state medical association and, therefore, the officers and house of delegates held a meeting on June 9 and 10 at Watertown. The officers of the district medical societies and the chairmen of all the standing and special committees were invited to attend.

Dr. P. D. Peabody of Webster, South Dakota, has announced the sale of the Peabody hospital and nurses' home to the Lutheran Hospital and Homes Society of America. The sale does not affect the clinic and the hospital and nursing staff will remain unchanged. The Lutheran Hospital and Homes Society has its headquarters at Fargo and operates 17 non-profit institutions in the midwestern states. The Webster hospital, now to be known as the Peabody memorial hospital has a capacity of 75 beds.

Dr. Myron C. Tank, of Brookings, South Dakota, has joined the Brookings clinic and will henceforth be associated with Dr. H. A. Miller and Dr. Magni Davidsson.

Among northwest medical men recently promoted in the Army are: William Donald Graham, M.C., St. Paul, lieutenant-colonel to colonel; William Congdon Harrison, M.C., Minneapolis, major to lieutenant-colonel; Theodore John Pfeffer, M.C., Racine, Wisconsin, major to lieutenant-colonel; David W. Hilger, M.C., and Lester T. Roach, M.C., both of St. Paul, captain to major.

Dr. H. M. Erenfeld of Minot, North Dakota, was elected president of the medical staff of Trinity hospital, Minot, May 8.

A public reception was given recently for Dr. and Mrs. A. Montero in Castlewood, South Dakota. Dr. Montero, a native of Costa Rica, has resided in this country four years and succeeds to the practice of the late Dr. J. B. Vaughn of Castlewood.

Dr. I. J. Bridenstine has moved from Terry, Montana, to Miles City to practice with the Garberson clinic.

Devils Lake, North Dakota, held its annual clinic for crippled children, sponsored by the Devils Lake Elks lodge in cooperation with state and county welfare boards on May 5.

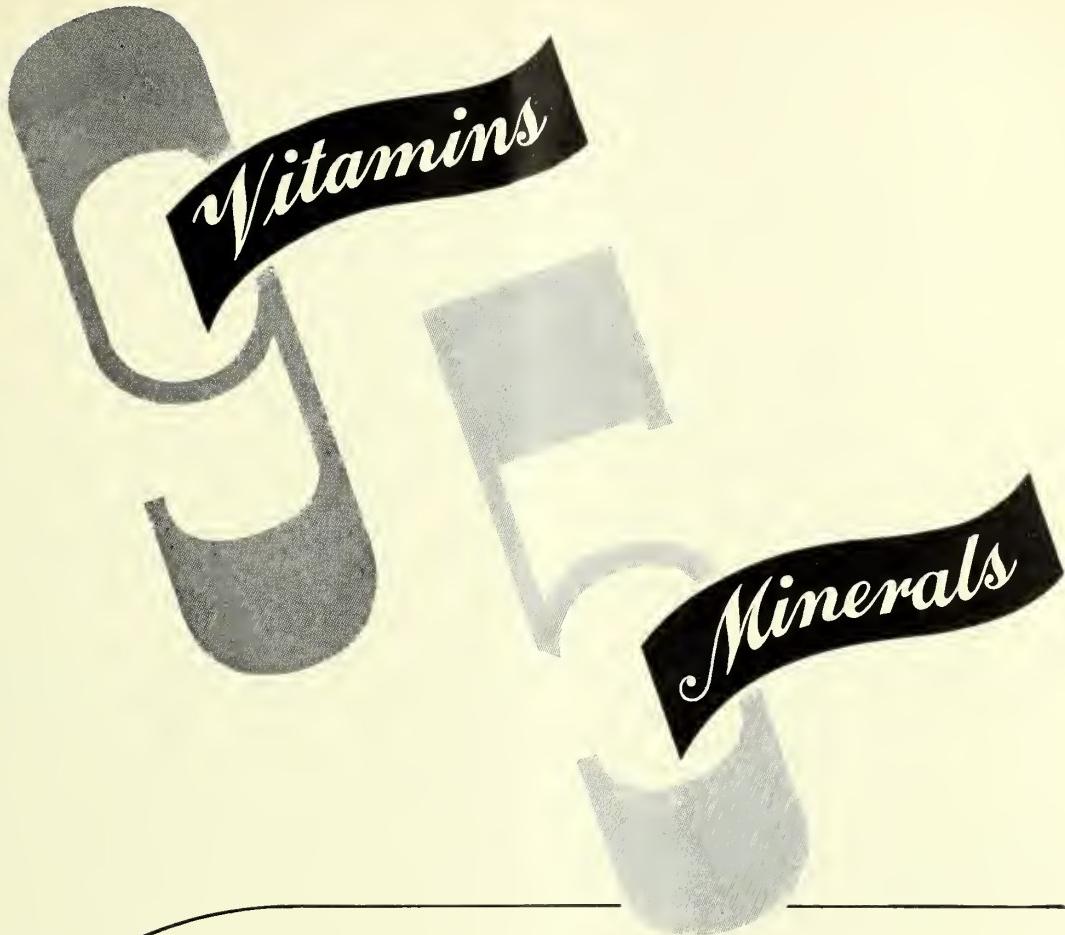
Necrology

Dr. Earle M. Young, 58, Mitchell, South Dakota, died March 21 of coronary occlusion. Dr. Young was a graduate of Rush medical school and practiced in South Dakota for 32 years. He was city health officer and widely known throughout the northwest.

Dr. W. M. Dodge, 78, Farmington, Minnesota, died in Miller hospital, April 28, after a long illness. Dr. Dodge was a graduate of the Minnesota medical school of the class of 1893.

Dr. R. W. Getty, 77, Galen, Montana, died suddenly of a heart attack on the train at Gold Creek, May 6. He had been a staff physician at the State Tuberculosis hospital at Galen for many years.

Dr. H. W. Power, 66, Conrad, Montana, died April 13 of carcinoma of the lung.



Many physicians have found Vitaminets 'Roche' the multivitamin-mineral product best suited to the requirements of modern medical practice and to the patient's preference for a conveniently administered preparation. It provides 9 vitamins and 5 minerals in a pleasantly flavored tablet which is willingly taken by children and adults—a tablet so palatable that it may be chewed. Available in bottles of 30, 100, and 250. HOFFMANN-LA ROCHE, INC., Nutley 10, N. J.

VITAMINETS 'ROCHE'

Classified Advertisements

ASSISTANCE AVAILABLE

Aznoe's, established in 1896, has available a number of well trained physicians (diplomates of the specialty boards, industrial physicians and surgeons, general practitioners, psychiatrists, tuberculosis specialists and residents). For histories, write Ann Woodward, Aznoe's-Woodward Medical Personnel Bureau, 30 North Michigan Ave., Chicago 2, Ill.

EQUIPMENT FOR SALE

1) Operating sterilizer, electric, volt 110, from Wilmot-Castle Co., Rochester, N. Y., original cost, \$232; 2) Intratherm short wave apparatus, Paul E. Johnson, Chicago, model 17 P, original cost, \$450; 3) Burdick colonic lavage apparatus, original cost, \$150; 4) one polariscope, Franz Schmidt & Haensch, Berlin, cost price, \$100; 5) one wood examining table; 6) obstetrical instruments at 50% of catalog list price. For inspection phone Dr. E. Klaveness, Nestor 6707, between 2 and 5 p. m.

FOR SALE

Forced to retire from general medical and surgical practice on account of health. Following equipment to be sold at private sale; medical library and cases, major and minor surgical instruments, cowhide emergency cases, electrical apparatus, modern white steel Hamilton office examining table, 1943. Communicate with N. K. Hopkins, M.D., Box 186, Arlington, South Dakota.

PHYSICIAN WANTED

Wanted: Physician and surgeon for well-established clinic in northwest with large industrial practice and twelve clinic branches located along the west coast. Excellent chance for the future. Apply to Dr. A. W. Bridge, The Bridge Clinic, 744 Market Street, Tacoma, Washington.

FOR RENT

Available July 1st, doctor's office, good south Minneapolis location on streetcar and bus lines. Heat and hot water furnished, step-on faucets, portable telephone plugs, buzzer system. Beautifully decorated; venetian blinds; indirect lighting. X-ray and developing rooms. Reasonable rent. Owner, S. Holland, 3615 - 18th Ave. South, Minneapolis 7, Parker 2249.

FOR SALE

Ultra violet ray (Alpine Sun) lamp made by Hanovia Chemical and Manufacturing Company for 110 volt alternating current. Call Ke. 0089, Stanley Partridge, 1010 Mount Curve Avenue, Minneapolis.

Advertisers' Announcements

POSTWAR JOBS IN MEDICAL OCCUPATIONS

Students, teachers, parents and others interested in medical occupations will find helpful information in three new six-page occupational abstracts on Medicine, Nursing, and Medical Laboratory Technologist, just published by Occupational Index, Inc., New York University, established under a grant from the Carnegie Corporation of New York.

Each abstract covers the nature of the work, abilities and preparation required, entrance and advancement, earnings, number and distribution of workers, postwar prospects, advantages and disadvantages and sources of further information, including a select bibliography of the five best references.

SQUIBB ADDS PITUITARY GONADOTROPHIN TO HORMONE LINE

For the treatment of hypogonadism resulting from pituitary hypofunction, E. R. Squibb & Sons, New York, have added to

their extensive line of hormone products a pituitary gonadotrophin. This is a highly purified, stable preparation extracted from the pituitary glands of horses, the pituitaries of which are richer in gonadotrophin than those of any other species except man. Pituitary Gonadotrophin Squibb contains the follicle-stimulating and the luteinizing hormones, the former being predominant and the latter being present in small amounts. Biologic standardization is expressed in rat units, one unit being the amount which, divided into six doses and administered during 72 hours to each of a group of at least 20 rats initially 28 days old, will cause uterine hypertrophy in more than 50 per cent of the group 24 hours after the last injection. Four such units similarly injected will cause at least a four-fold increase in ovarian weight as compared to control rats.

Pituitary Gonadotrophin Squibb is supplied in dry form in 5-cc. rubber-diaphragm capped vials containing 125 rat units (25 units per 1 cc.) together with a 5-cc. ampul of sterile isotonic solution of sodium chloride for use as a diluent.

"PIONEERS OF AMERICAN MEDICINE"

The May issue of *Coronet* contained eight pages of reproductions in four colors of the celebrated "Pioneers of American Medicine" series which Dean Cornwell, noted American muralist and genre painter, and member of the National Academy, has executed to date for Wyeth Incorporated, of Philadelphia.

In faithful detail some of the most celebrated dramatic scenes in the history of American medicine are illustrated. These are: "The Dawn of Abdominal Surgery," "Osler at Old Blockley," "Beaumont and St. Martin," "The Father of American Pharmacy," "Conquerors of Yellow Fever."

Feeling that American physicians and scientists should be better known to their fellow countrymen, Wyeth Incorporated conceived the plan of commissioning an outstanding American illustrator to do the series in 1939. So far, five canvases have been completed. Says *Coronet*: "It is to be hoped that the series 'Pioneers of American Medicine' which we have reproduced by special permission of Wyeth Incorporated will contribute in a small measure at least to the clearer recognition of the achievements of our American medical heroes." (Originals of the Cornwell paintings were on exhibition at the Enoch Pratt Library in Baltimore in May.)

NEW SEDATIVE-ANTISPASMODIC

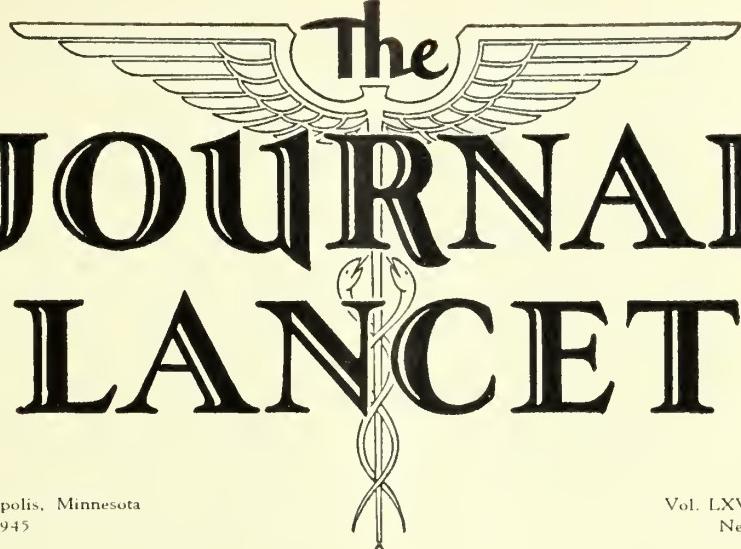
Hoffman-La Roche, Inc., of Nutley, N. J., recently announced to the medical profession a new, superior sedative-antispasmodic called Syntronal. Syntronal has a threefold effect in all disorders associated with smooth muscle spasm and nervous tension. It selectively inhibits the parasympathetic terminations in smooth muscle but in contrast to atropine it is not likely to cause undesirable side reactions; it also has a direct relaxing effect on spastically contracted smooth muscle fibers, and it relieves nervous tension and apprehension which are often significant factors in spastic disorders. Syntronal may be prescribed with complete confidence in all disorders in which smooth muscle spasm is responsible for pain and functional disturbances. Syntronal is available in sugar-coated tablets, bottles of 30 and 100. Each Syntronal tablet contains 50 mg. of Syntropan "Roche" (phosphate of d,l-tropic acid ester of 3-diethylamino-2, 2-dimethyl-1-propanol) and 15 mg. of phenobarbital.

NION CONDOCAPS FOR ARTHRITIS

Nion Corporation announces a new improved Condocap for the treatment of arthritis. In addition to the new formula Condocaps have been streamlined. The vitamin content has been emulsified in and coated with gelatin. The emulsion permits gradual disintegration and controls after taste. Their smaller size makes them more easily swallowed.

The increased vitamin B complex factors in Condocaps help to avoid an occasionally encountered sensitivity and to improve the coexistent malnutrition. Each Condocap Improved contains: Vitamin D, 50,000 U.S.P.XII units; thiamine, 0.5 mg.; riboflavin, 0.5 mg.; niacinamide, 2.5 mg.

Vitamin D has been used in arthritis for more than ten years with material success and is a valuable adjunct to a well-rounded program of treatment. The earliest signs of improvement are usually nutritional followed by increased muscle tone, less stiffness, diminution of pain, increased mobility, decreased swelling, lessened deformity, less tendency to become fatigued, and a gradual return to normal functional activity.



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New Series

Indications for Bronchoscopy in Pulmonary Disease*

Paul H. Holinger, M.D.†
Chicago, Illinois

IN recent years bronchoscopy has become a universally accepted procedure in chest work. The bronchoscope is considered simply a speculum used to visualize, directly, the trachea and bronchi. Indications for bronchoscopy have so broadened that now the procedure is considered a routine aid in both the diagnosis and the treatment of diseases of the chest. New instruments and new technics have made possible and safe the bronchoscopic examination of a patient of any age—from the newborn infant to the adult.

There are three general headings under which indications for bronchoscopy may be listed: Bronchial obstruction, pulmonary suppuration, and obscure pulmonary pathology requiring further diagnostic study.

Bronchial Obstruction. The changes in the lung produced by an obstructed bronchus were first recognized from a study of the action of aspirated foreign bodies. This action may be compared with the action of valves causing partial or complete obstruction to the flow of air, with a resulting obstructive emphysema or atelectasis, depending on the degree of obstruction. Foreign bodies still play a prominent role in pulmonary pathology, but are often overlooked for weeks, months or even years, when the destruction of the lung distal to the obstruction calls for x-ray and bronchoscopic study.

Bronchial tumors produce findings identical to those of foreign bodies in the bronchi. Benign tumors, adenomas, are found most frequently in women, between the ages of 25 and 45 years, and give symptoms of

cough, hemoptysis, wheezing, and repeated attacks of pneumonia associated with the acute phase of complete atelectasis. Malignant tumors, bronchogenic carcinomas, are found most frequently in men. The incidence is rising rapidly, and some statistics now place bronchogenic carcinoma second in frequency of malignant tumors in males. The early symptoms of bronchogenic carcinoma are a persistent cough, a wheeze, occasional hemoptysis, atypical pneumonia and discomfort or pain in the chest. Later the cough becomes productive and hoarseness and dyspnea may develop; there is a loss of weight and general debility with a rapid down-hill course. The importance of early recognition of this condition is that surgical resection of the lung, if done early enough, will rid the patient of the carcinoma. Otherwise, life expectancy is six months to two years. A positive biopsy can be obtained bronchoscopically in approximately 80 per cent of cases.

Suppurative Diseases. The principal symptom of chronic broncho-pulmonary suppuration is the constant productive cough. This symptom is often so routine to the patient that he is not aware of it except as it is increased in frequency and productivity with exacerbations produced by upper respiratory infections. The patient's family, however, is usually acutely conscious of the annoyance. With increasingly accurate methods of diagnosis by bronchoscopy and bronchography, the significance of this condition can be measured and steps taken to prevent its progression to actual bronchiectasis, the disease it simulates. Patients with a chronic cough of this type require a thorough sinus survey, a bronchoscopy to determine the type of organism or organisms responsible for the infection and a lipiodol study of the bronchi

*Prepared and presented to the South Dakota State Medical Association annual meeting, May 21, 22, 23, 1944.

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to note if dilatations of the bronchi have yet occurred. Treatment is determined by the bacteriology of the secretions aspirated from the terminal bronchi. Autogenous vaccines are of considerable benefit in some cases, while the use of intravenous arsenicals such as neoarsphenamine and mapharsen are specific for infections due to the fusospirochetal group.

Bronchiectasis is a disease characterized by pulmonary suppuration complicated by one of several types of bronchial dilatation. The advanced bronchiectatic patient presents a classic picture. His bloated, pasty appearance, barrel chest, clubbed fingers, dyspnea and constant cough which is frequently productive of large quantities of foul muco-pus, make him a social outcast. Occasional hemoptysis from oozing granulations or ulcerations adds to his discomfort, debility and apprehension. There is frequently an associated pansinusitis. Repeated pulmonary infections occur with fever, pleuritic pain, malaise, and signs suggestive of pneumonia as a result of bronchial obstruction and retention of secretions. As a rule, the patients are better in summer than in winter, and may be entirely free of the cough until an upper respiratory infection early in the fall causes reinfection of the bronchi.

The severity of symptoms, however, is dependent upon the degree of bronchial dilatation and pulmonary infection. Some patients can evacuate the bronchial tree by paroxysms of cough in the morning and evening, and are relatively free of symptoms during the remainder of the day. Others complain only of the loose rattling cough, and in the so-called dry bronchiectasis the only symptom may be the occasional hemoptysis.

Almost every field of medicine enters into the treatment of the bronchiectatic patient. His general resistance must be increased in order that he may better handle the frequent inter-current infections. This includes rest, high caloric, high vitamin diet, strict attention to oral hygiene, and thorough eradication of sinus pathology. Early recognition and removal of foreign bodies, dilatation of bronchial stenoses, bronchoscopic aspiration of areas of pulmonary suppuration and suppurative bronchitis aid in preventing the development of this disease.

The active treatment should be directed toward establishing and maintaining adequate bronchial drainage. This can be done by postural drainage, but must be supplemented by the better evacuation of secretions that can be accomplished by bronchoscopic aspiration. In the advanced case this is particularly indicated as a palliative procedure, while in the case of pre-bronchiectatic atelectasis it will arrest the process and prevent further destruction. Vaccines prepared from bronchoscopically obtained secretions are of considerable benefit in some cases. In unilateral and even in some bilateral cases lobectomy gives complete and permanent relief of symptoms. Lobectomy or pneumonectomy are the most important adjuncts developed for the treatment of this disease in recent years.

Lung Abscess, non-tuberculous, is a localized suppuration of pulmonary tissue associated with cavity formation, which may be found anywhere throughout the lung

tissue. The presence of a fluid level depends upon whether or not bronchial or external drainage is established.

Because of the serious nature of this disease, internist, surgeon and bronchoscopist together should regulate the course of therapy. Postural drainage aids many patients, and they learn to lie in the position which best evacuates the cavity or cavities. However, in the markedly debilitated patient with large quantities of pus, it may be overdone. Neoarsphenamine, whether or not fusospirochetal organisms have been demonstrated, generally aids in reducing the foul odor of the sputum.

Bronchoscopy, both for diagnosis and treatment, is definitely indicated. Aspiration of secretion, dilatation of stenotic bronchi leading to the abscess, and removal of obstructing granulation tissue from the bronchus can be accomplished in this manner. Bronchoscopic lavage of chronic abscesses has been found by some to be of considerable benefit. These procedures can all be done under local anesthesia in adults and without anesthesia of any kind in children.

In acute cases, drop in temperature, reduction of cough, and marked general improvement of the patient following the establishment of adequate bronchial drainage of the abscess cavity are most striking. Surgery should not be delayed, however, in those cases which do not show a fairly prompt response to these more conservative procedures.

Postoperative Massive Collapse of the lung is the massive atelectasis due to the obstruction of one of the main bronchi by thick, viscid, muco-fibrinous secretion, and may follow any surgical procedure. Important etiologic factors are those which tend toward an increase in the production of mucoid secretion by the tracheobronchial mucosa, associated with those which aid in the stagnation of these secretions by retarding the cough reflex and the expansion of the chest.

The first symptoms usually occur twenty-four to forty-eight hours after the operation, beginning with chest pain and a persistent, somewhat productive cough which the patient attempts to suppress, because of both the pain at the site of incision and the chest pain. Respiration becomes shallower and more rapid, soon being definitely labored. This may progress to cyanosis. There is a correspondingly rapid rise in the temperature, but the pulse rate does not rise proportionately. The sputum at the onset is usually scanty; it is thick, tenacious, glossy or white. Later it becomes purulent.

The physical findings, essentially, are the shift of the heart and mediastinum to the affected side, dulness, limitation of motion, and elevation of the diaphragm. Breath sounds change rapidly, depending on the amount of obstruction and whether a coughing spell dislodges secretions. They may be entirely absent, suppressed, or bronchial in character, depending upon the existence of partial or complete atelectasis.

The roentgen ray findings are of greatest importance and consist essentially of the three cardinal signs of an atelectatic lung, namely: (1) the marked shift of the heart and mediastinum toward the affected side, (2) the

elevation of the diaphragm on the affected side, and (3) the increased density of the involved lung. There is, of course, a compensatory emphysema of the opposite side.

The oft-repeated statement that this condition is due to a plug of mucus in a main bronchus does not adequately describe the pathology. There is, instead, a production of thick, viscid, tenacious secretion throughout the entire tracheobronchial tree, almost as much being found on the unaffected as on the collapsed side. The bronchial mucosa is little changed in the early stages of this condition, and there are relatively few bacteria in the secretion. Later, the secretion becomes purulent and foul smelling because it has been an excellent culture medium for organisms. A purulent bronchitis develops which may progress to lung abscess or bronchiectasis, or to a fatal termination as the patient drowns in his own secretions.

Postoperatively, certain factors are of great importance both prophylactically and therapeutically. The common practice in recent years of hyperventilating the lung immediately after completion of the anesthetic seems to be of utmost benefit. The use of carbon dioxide and postural changes every two or three hours, day and night, should some chest symptom arise, is definitely indicated. Certainly the use of carbon dioxide is of more value than the administration of oxygen, because the carbon dioxide stimulates more active respiratory action, which tends to displace the obstructing secretion. Oxygen, on the other hand, allows the patient to obtain the same amount of pulmonary exchange on shallower respiration. Obviously, this is to be avoided, but the administration of oxygen to a dyspneic, cyanotic patient is too frequently the first step taken and, unfortunately, appears to be rational.

The use of a tight abdominal binder, especially in a case of an upper abdominal operation, further limits the respiratory excursions and increases the incidence of collapse. Sedatives and atropine should be withheld. Bronchoscopic aspiration of the obstructing secretions, when these methods fail, should be employed without hesitation. On introduction of the bronchoscope through the larynx, one is impressed by the tremendous amount of secretion lying in the trachea and both bronchi. Because of its viscosity it is aspirated with difficulty; but, by using an aspirating bronchoscope and an independent aspirator, more secretion can be removed in a minute or two than the patient can cough up in several days. The secretion, if the aspiration is done shortly after the onset of the collapse, is white, very thick, viscid and tenacious, and it usually clots in the collecting tube. It contains a great deal of fibrin but very little pus and few bacteria.

The change in the general condition of a patient following bronchoscopic aspiration is often as striking as that seen following tracheotomy. The immediate relief is reflected in the temperature, pulse and respiration curves. Physical findings and roentgen ray show a rapid return to normal, although the cough continues to be productive for a few days. Should there be a tendency toward replugging, however, one need not hesitate to do repeated bronchoscopic aspirations.

Asthma. The bronchoscope can be used to aspirate obstructing secretions in asthmatics to give them marked relief if symptoms are caused by bronchial obstruction. Moreover, inspection of the tracheobronchial tree may yield considerable information of diagnostic significance.

Obscure Pulmonary Lesions. Under this heading may be mentioned certain indications for bronchoscopy of a strictly diagnostic character. Bronchoscopy is obviously contraindicated in cases of gross hemoptysis, but should be done to establish a diagnosis in cases of occasional hemoptysis after the sputum has been found negative for tubercle bacilli. The thin stream of blood frequently may be followed to its source, and a small tumor, ulcer or inflammatory area found there to account for the hemoptysis. Similarly, a wheeze or a constant cough of undetermined etiology is an indication for bronchoscopy. Cough is a symptom, and its cause must be investigated, not merely covered by cough mixtures. Bacteriologic examination of the aspirated material may reveal a yeast or fungus infection not demonstrable in the sputum.

In closing, some of the newer phases of bronchoscopy may be mentioned. Pulmonary tuberculosis was long considered a contraindication to bronchoscopy. It is still true that the uncomplicated case of tuberculosis does not require bronchoscopy either for diagnosis or treatment, and when the sputum of a patient is found to be positive, findings other than the actual pulmonary lesion itself are necessary to indicate the procedure. However, in recent years an increasing number of tuberculous lesions of the tracheobronchial tree have been recognized. These require direct inspection in order that diagnostic phases can be clarified and endobronchial therapy instituted. Occasionally the diagnosis of tuberculosis is made by examination of the bronchoscopically aspirated secretions even though previous sputum tests were negative.

Ulcerations of the mucosa and cartilages of the tracheobronchial tree comparable to the tuberculous ulcers seen on the epiglottis are frequently the source of positive sputum when a good collapse of the parenchymal lesion has been obtained. Cauterization of these lesions through the bronchoscope hastens the healing process. A tuberculoma within the lumen of the trachea or bronchi may produce no signs or symptoms other than a wheeze, but it may become large enough to obstruct a major bronchus or the trachea and, consequently, produce dyspnea, due to obstructive emphysema or atelectasis. The removal of these tumors, either by forceps or cautery, is indicated to keep the airway patent and to prevent a suppurative process from developing below the obstruction. Similarly, tracheal or bronchial obstruction may develop by pressure from outside the lumen, due to a tuberculous enlargement of the hilar glands. This is fairly common in infants and children. Occasionally a gland ruptures into the bronchial lumen. Finally, the general thickening and distortion of the walls of the trachea and bronchi, produced either by healing ulcerations or contractures associated with the healing parenchymal lesion, is seen. The various collapse therapy procedures, especially pneumothorax and thoracoplasty, likewise cause a marked distortion of the bronchi. This is occasionally so marked that stenosis of a major bron-

chus occurs, producing a collapse of the lung distal to the obstruction which, if present over a long period of time, produces bronchiectasis.

Biplane Fluoroscopy. The removal of foreign bodies from the costophrenic angle or from upper lobe bronchi has always been one of the most difficult foreign body problems. Within recent years the development of the biplane fluoroscope has made it possible to remove a large percentage of these foreign bodies. The entire bronchoscopic procedure is guided in two planes by the fluoroscope. In a similar manner, forceps may be guided to a peripherally lying pulmonary tumor to obtain tissue for biopsy.

Bronchoscopy in Newborn Infants. In infants a day or two old, the mechanisms of bronchial obstruction are identical to those produced by the aspiration of foreign bodies. However, because of the small caliber of the bronchial tubes of infants, a very slight obstruction causes gross pulmonary changes which will endanger life.

In acquired atelectasis, the principal etiological factor mentioned so commonly in obstetrical textbooks is the aspiration of amniotic fluid and mucus during the passage of the infant down the birth canal. Bronchial suction with a catheter is almost a routine procedure, and it should be employed especially if mucus can be heard gurgling in the trachea. The use of the catheter is not without trauma, and one must constantly keep in mind the delicate nature of the larynx. More recently, aspiration by direct method, exposing the larynx with a laryngoscope and extending the aspirator through it, has given

better results. One clinic suggests this as a routine procedure even before the child cries, aspirating all secretions from the mouth before they can get into the trachea and further into the alveoli. Bronchial exudates due to infective processes produce similar changes. These are characterized most outstandingly in cases of laryngotracheobronchitis in which frequent attacks of bronchial obstruction are one of the most typical features of the disease.

Bronchial obstruction due to compression from without the bronchus is occasionally caused by pressure from an enlarged heart or a congenital anomaly in which one of the great vessels crosses a main bronchus. We have observed a number of these cases recently, together with cases of bronchial obstruction caused by congenital bronchial webs. Dilatation of the web resulted in immediate relief of symptoms in one 24-hour-old infant.

SUMMARY

1. The bronchoscope serves as a speculum to permit the direct inspection of the tracheobronchial tree of a patient of any age.
2. Indications for bronchoscopy, which were formerly limited to the extraction of foreign bodies, have broadened so that now bronchoscopy is an accepted routine aid in the diagnosis and treatment of bronchial obstruction, suppurative diseases of the bronchi, and in the investigation of obscure pulmonary lesions. It is an addition to the armamentarium of the physician studying diseases of the respiratory tract, and not a substitution for other procedures.

Fatigue as a Symptom in Depressed Patients

Gordon R. Kamman, M.D., F.A.C.P.

St. Paul, Minnesota

BY fatigue syndrome we mean that group of symptoms complained of by patients who experience physical or mental depletion, or both. In the weakness associated with depressions we find two factors operating. These are psychomotor inhibition, and hypoglycemia.

Psychomotor inhibition is one of the cardinal symptoms of mental depression. By definition, "inhibition" means holding back, checking, restraining, or hindering. Patients suffering from psychomotor inhibition complain of feeling tired, of not being able to get started on their daily tasks, and of an abnormal inclination to procrastinate. They make up their minds that they are going to do a certain thing but they never seem to get to it. Everything seems too big for them. The housewife tells us that daily chores which formerly were performed with a routine automaticity now loom up as jobs impossible of accomplishment. The businessman tells us that he cannot get started on the mass of routine material that awaits him when he sits down at his desk in the morning. In most patients this inhibition is worse in the morning,

and, in spite of the fact that they may sleep well (with or without sedatives) they awaken in the morning not refreshed. In many cases this inhibition tends to diminish as the day progresses, and patients frequently say that if they always could feel as well as they do toward evening they would not be consulting a doctor. One of the key questions asked a patient who complains of fatigue should be "what time of the day do you feel the most tired?" If the answer is "in the morning, but toward evening I always begin to feel better," we suspect immediately that the patient is suffering from some form of depression. With others, however, the inhibition persists through all the waking hours and they say that they are "all tired out." From an examination of the patient's history it soon becomes obvious that work in and of itself does not lead to this chronic condition which the patient calls weakness. Neither is the feeling relieved by rest. It is a sort of spurious fatigue—a true psychomotor inhibition which is misnamed "weakness."

The pathogenesis of psychomotor inhibition is not known. We feel that it is purely psychic in origin—a

psychic retardation that makes it impossible for the patient to accomplish ordinary things without expending much more effort than is ordinarily required. Special analytical techniques such as the Rorschach method show that there is a decrease in intellectual energy but no disorganization of the intellect itself. It is as if the machinery of the personality were intact but the psychological voltage were not sufficiently strong to drive the machine. The important point is that it is not sheer laziness, and that it will not respond to threats, scoldings, and pep talks so frequently administered by families, friends, and, alas, sometimes by the family physician.

The treatment of psychomotor inhibition which is erroneously interpreted as fatigue inheres in the treatment of the depression of which it is a part. The first important point is to avoid intensifying the patient's already present guilt reactions by threats and imprecations. Even long before he discloses his condition to anybody else the patient has communed with himself and has come to the conclusion that he is "no good." This creates a guilt reaction which begets more psychomotor inhibition. Therefore I believe in permissive therapy. The first step is to give the patient permission to be sick. Knowledge on his part that at last he has found somebody who realizes there is something really wrong with him is, in and of itself, of great therapeutic importance. Next, the patient should be put on a rigid activity schedule and made to follow it. He should retire and rise at exactly the same time each day. He should lie down for exactly one hour after the noon meal, and he should go for a walk at exactly the same time every morning and every afternoon. The length of these walks should be systematically increased according to an exact schedule until the patient is walking three miles a day. At first, work and social activities are interdicted but later in the program they may be taken up gradually. Psychotherapeutic interviews either daily or three times a week are of the utmost importance. Our discussion today does not include the psychotherapy of fatigue.

Various drugs have been recommended in the treatment of fatigue associated with depressions. The one most frequently referred to is Benzedrine Sulphate and, more recently, dexedrine sulfate. I regret to say that, in my experience, the results of treatment with these drugs have been disappointing. However, it does no harm to try giving a patient 5 or 10 mg. of benzedrine sulfate, or dexedrine, upon arising and repeating the same dose four hours later. Sometimes patients feel better when taking it. In some cases I have given it intravenously but can not see any particular advantage in employing this route of administration. Another drug which has been widely used in the treatment of the psychomotor inhibition is opium. I have found this useful in a large number of cases, and 1.00 cc. tincture of opium can be given three or four times a day over a period of several weeks without causing addiction. A high vitamin intake, intravenous injections of large doses of thiamin chloride, intramuscular injections of the various iron and arsenic tonics all have a very limited usefulness. On the whole, the results of chemotherapy alone in depressions have been none too encouraging. Nevertheless, drugs can be

considered a valuable *adjunct* to the other therapeutic modalities at our disposal for the treatment of these conditions, although it must be remembered that they are only adjuncts. The same applies to the various forms of shock therapy.

The second factor operating to cause fatigue in depressed patients is a derangement in carbohydrate metabolism which results in a state of more or less chronic hypoglycemia. The brain is dependent for its normal functioning upon a carbohydrate substrate,¹ an adequate supply of oxygen,² and various enzyme and co-enzyme systems.³ A disturbance in any one of these constituents interferes with brain metabolism and, therefore, with brain function. Carbohydrate is the preferred food-stuff of normally functioning brain tissue, although the exact way in which it does its work is not known. Symptoms of hypoglycemia depend more upon the rapidity of change in the concentration of blood sugar than the actual amount of sugar in the blood. Thus it is possible for a patient's blood sugar gradually to be lowered to abnormal levels without producing any signs whatsoever.⁴ Therefore, simple determinations of the fasting and non-fasting blood sugars do not always give us a clue as to whether or not hypoglycemia is present. It is not so much the absolute level of sugar in the blood as it is the speed with which the blood sugar level has been lowered. Unless one is aware of this fact many cases of hypoglycemic fatigue will be missed. As a matter of fact too much reliance should not be placed upon the glucose tolerance curve. In many cases even when the glucose tolerance curve appears to be normal, I have administered orange juice and sugar to patients and they have responded with remarkable improvement.

For many years it has been known that pancreatic adenoma, hepatic disease, dietary insufficiency, endocrine dyscrasias, and vitamin deficiencies might cause hypoglycemia. In addition to these well known types, I believe that there also is a psychogenic hypoglycemia. Rennie and his co-workers⁵ report a number of cases of chronic hypoglycemia accompanying mental depressions. Some of these patients had recurring attacks of depression, and with each attack showed symptoms that were indubitably hypoglycemic in origin. Curiously enough, the hypoglycemic episodes in these patients were usually postprandial. Treatment of the disorder was focused on the personality disturbance and when the depression lifted, the hypoglycemic symptoms disappeared. Flat glucose tolerance curves became normal when the personality disorder was adjusted. Here we see but another one of the numberless examples of how the emotional state of an individual can be reflected in somatic function. One need not go into the tremendous psychogenic factor in the genesis of peptic ulcer, for instance.

In order to understand the pathologic physiology of psychogenic hypoglycemia, let us briefly review what is known of the neurophysiology of the pancreas. It has been shown⁶ that stimulation of the right vagus nerve in animals results in a lowering of the blood sugar level if the pancreatic vein is not ligated. Ligation of the pancreatic vein prevents lowering of the blood sugar level by vagus stimulation, and this can be interpreted to mean

that the change in concentration of blood sugar following stimulation of the right vagus nerve is due to an increase in the secretion of insulin. It has also been shown⁷ that in rabbits, drugs which stimulate the parasympathetic nervous system (vagus) produce a fall in the blood sugar level. Now, the thalamus is the cerebral center for our emotional reactions, and in the thalamus there also is a center which, through the vagus mechanism, stimulates pancreatic secretion of insulin.⁸ Therefore, it is understandable in what manner mental depression can result in chronic hypoglycemia with consequent symptoms of fatigue, tension and irritability. This is what I have referred to as "psychogenic hypoglycemia." It may be the explanation of those reported cases of "chronic functional hypoglycemia" in which none of the organs show any pathologic changes at autopsy.

The dietary management of fatigue resulting from psychogenic hypoglycemia is sometimes difficult. Some patients gain strength when given two teaspoonfuls of sugar in eight ounces of orange juice four times a day. Sometimes I also prescribe small doses of ephedrine sulfate, but this is not always necessary. On the other hand, some patients experience an increase in their hypoglycemic symptoms when taking orange juice and sugar. I believe that in these individuals the pancreas is abnormally labile. In such cases the procedure suggested by Portis⁹ may be given a trial. According to this method, a diet high in protein, moderately high in fat, and relatively high in carbohydrate is given. The proportions are P. 141, F. 127, and C. 253. This gives 2719 calories. Deaminization of the protein in the liver takes place slowly and the carbohydrates are given in complex form so they, too, break down slowly. In this manner the impact upon the pancreas is much lessened. As a consequence, pancreatic stimulation is not so strong, and the resultant output of insulin is reduced. This protects the patient against hypoglycemia. In addition to this type of diet the patient is also given 1/200 to 1/150 gr. atropine sulfate three times a day one-half hour before meals. This tends to inhibit the action of the vagus, thus reducing the amount of insulin secreted by the pancreas. I have used this treatment in a fairly large number of cases and, while I have not tested the results statistically or run a control series, I am sure that a number of patients have been benefitted by it. One of our leading psychoanalysts, Franz Alexander,¹⁰ discussing this condition in a recent communication reports the case of a

45-year-old married woman who was suffering from periodic attacks of diarrhea, headaches, and overwhelming fatigue. The patient's diarrhea reacted favorably to psychoanalytic treatment but the fatigue which the patient called her "pernicious inertia," resisted the psychoanalytic approach. Suspecting that the fatigue was on a physiological basis metabolic studies were made and a flat glucose tolerance curve was found. The diagnosis was "relative hypoglycemia due to hyperinsulinism." The patient improved rapidly under the atropine and diet management described by Portis and Zitman. Dr. Alexander goes on to say "in all cases the physical fatigue improved or disappeared completely under medical management and psychotherapy. In almost all cases the disappearance of the fatigue syndrome brought the underlying emotional situation more sharply into consciousness and facilitated the psychotherapeutic approach to the basic personality problem. In all cases the disappearance of fatigue counteracted the regressive, escaping tendencies of the patient, and in the majority it created a more optimistic outlook."

In conclusion I wish again to emphasize the fact that fatigue is but one of a number of symptoms in depressions. Treatment must not be focused on any single symptom but must include in its scope the entire clinical picture. This means that we cannot rely upon drugs alone, but must also employ rational psychotherapy, physiotherapy, diet, occupational and recreational therapy, and carry out an intelligent management of the patient's life situation as a whole.

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EXPANDING FACILITIES AT UNIVERSITY OF MINNESOTA MEDICAL SCHOOL

With all the post-war planning no phase is more exciting than the plans to expand our educational facilities. These have gone even farther in Britain than in our own country but there is no doubt that as rapid strides will be made here. In the medical school of the University of Minnesota Dr. Diehl has announced that a wide increase in the staff is expected and that the present accelerated training program will be continued; that the building program includes a library, a school of public health and the Mayo Memorial. A school for postwar refresher and specialized courses for the more than 500 Minnesota doctors now in service is being discussed.

Malaria

Medical Observations in South China and Notes on the Health Situation in an Internment Camp Under the Japanese

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PART I. MALARIA

MALARIA is a disease in which I have taken quite a personal interest, because during our four and one-half years' stay in South China it was acquired first by my one-year-old son, then by myself, and finally by Mrs. Lawson. Because it is a disease which is coming to have some practical importance to the medical profession here in Montana, I propose to spend most of the allotted time in discussing it.

Until 1941 the United States of America rested quite secure, apparently, depending upon geographical isolation as protection from political and military peril from overseas. The present war has upset this isolation. A parallel may be drawn in respect to disease. Before the war, we in the northern states saw only a rare case of malaria. To recall the only one that I remember in four years of practice, a workman on the Fort Peck dam in 1936 suffered a broken leg. A day or so later he developed a chill and a spike of fever up to nearly 105°. Malarial parasites were found in the blood smear. He had lived in southern Illinois but did not know that he had ever had malaria.

In contrast, having now completed four months of practice resumed in the small city of Glasgow, Montana, I have seen four cases of malaria in men returned from overseas. It is said to be the most important disease with which mankind has to contend, and "according to a recent estimate 800,000,000 people suffer from this disease."¹ The barrier between us and this huge reservoir of disease is being broken down by the war, and by rapid means of travel. The effect, trifling now, will grow as millions of the armed forces return from the South Pacific, India, China, Burma, North Africa, Sicily, Italy, and later other areas in all of which malaria is endemic.

What are the consequences? First, all of these people, once infected, are subject to possible recurrences of greater or less frequency during a period of some years after leaving malaria-infested territory. These recurrences and original attacks may simulate other diseases and complicate surgical procedures, childbirth, etc.

Second, an original attack may not occur until the patient returns to this part of the country. When members of the armed forces and others enter an area where malaria is prevalent, it is common practice to give routinely enough anti-malarial drugs to prevent clinical evidence of the disease from appearing. This is important to prevent morbidity at a critical time. But this does not prevent the person's acquiring the infection, which remains latent as long as he is taking the drug, and usually a while longer. When he leaves the malarial country, naturally the dosing with anti-malarial drugs is stopped, and after a week or two, or longer, he may have a sud-

den attack of malaria. Thus one of the patients I saw in Glasgow told me that he reached San Francisco without having ever known that he had acquired malaria in the South Pacific. Just arrived, he was suddenly taken severely ill with high fever and soon became unconscious. He was rushed to a naval hospital, the correct diagnosis made, treatment instituted, and he recovered. I have been told that a somewhat similar case arriving at an eastern port died before a correct diagnosis was made. This raises the question of the different types of malaria. I formerly had the impression that malaria was easily diagnosed clinically: a sharp fever, apparent recovery, then a return of the fever in one or two days, etc. In Canton, this type was the exception rather than the rule. Most of the cases I saw there were the so-called malignant sub-tertian type, rarely giving the classical picture of malaria. I understand that this type is quite widespread in both the South European and Pacific theaters.

Another effect of malarial infection is said to be to provoke falsely positive Wassermann and Kahn tests.² I have not observed this myself.

A danger which gave me much concern in China, however, and which is bound to become more and more of a problem here, is the likelihood of transmitting malaria by means of blood transfusions. A donor does not have to be suffering from a clinical attack of malaria to transmit it when his blood is given to another. It may have been latent for years, or he may never have had a definitely recognized attack. This means for practical purposes that all of the millions of Americans who will have lived in malarial areas during these years are eliminated as safe blood donors for an indefinite period of years. This is said to apply even to refrigerator-stored blood. I have seen no data as to whether it applies to plasma or not. An officer in the army medical corps told me that it was his opinion that there was no fear on that score from the use of dried plasma.

A fifth possible consequence of the return of many malaria-infected persons to this part of the country is that the infection may be carried to other people by mosquitoes, the natural vector. Dr. Kilbourne, epidemiologist of the Montana state board of health, has told me that anopheles mosquitoes have been found in Montana. To quote Beckman: "after the war (World War I) the return of troops and the interchange of people caused its (malaria's) reappearance in many places long free of it: England, Germany, Russia (one of the worst epidemics in history), far up in the arctic at Archangel."³

The details of diagnosis, clinical forms, and treatment are not within the scope of this paper. My brief bibliog-

raphy and the bibliographies given by the sources I have indicated, will guide one who desires a more exhaustive study.^{1,4,5}

However, the plan of treatment which I have been persuaded is most reasonable, is as follows: Here, in non-malarial country, treat only the acute attack. For the first attack, or recurrence, give atabrine, to the average adult $1\frac{1}{2}$ grains (0.1 grams) three times daily for five to seven days, only. After a four-day rest period give plasmochin $\frac{1}{6}$ grain (0.01 grams) three times daily for five days. Then wait until if and when the next attack occurs. In this event, give quinine, if it is available, 5 grains (0.3 grams) three times a day for one week. In addition, either concurrently with the quinine or following it, give plasmochin $\frac{1}{6}$ grain (0.01 grams) three times a day for five days. The atabrine and plasmochin should not be given concurrently, and not in over-dosage. Even that dosage may give definite yellowish discoloration of the skin, which may persist for several weeks, and is distinguishable from jaundice by the fact that the sclerae do not become discolored.

One toxic effect sometimes noted following the taking of atabrine in even this dosage is a manic tendency. I noted this in my own case following a treatment of a mild recurrence in 1942. I began giving birth to more ideas than I have ever had before or since. Two hours sleep a night was all I seemed to have any need for, there was no feeling of fatigue, and everything that occurred seemed funny. (Perhaps I should take atabrine often!) However, I had some insight into the condition, rested for several days, and it passed off. I mention this because I have noticed a tendency among many malaria patients to take over-doses of the medicines used. With the present shortages of these drugs, they are available on prescription only, and the responsibility of preventing over-use rests with us.

PART II.

MEDICAL OBSERVATIONS IN SOUTH CHINA

Hydatidiform mole was seen with striking frequency in Canton. It is reported to occur once in every 2500 to 3000 pregnancies in America, yet five to seven cases were admitted and operated upon each year at the Hackett Medical Center in Canton. That hospital is of 120-bed capacity, but the number of confinement cases cared for per year is only 200 to 500. However, due to economic reasons and custom, only a small proportion of the normal obstetrical cases come to the hospital, while, because of the attendant bleeding, probably most of the mole cases do come for treatment. Thus the true statistics are impossible to arrive at, but the incidence is certainly much greater than in America. I did not see chorioepithelioma while I was there, but doctors long on the staff say it has occurred, but not frequently.

Beriberi is of frequent occurrence, and an interesting complication was described in a publication by a woman medical practitioner in Hong Kong; a toxin in the breast milk of mothers suffering from beriberi which poisons babies fed upon the breast, perhaps fatally if persisted in, but from which they recover if they are put on a formula or furnished with a healthy wet nurse.

Tuberculosis is very prevalent, perhaps due to lack of racial immunity (which the white race has acquired to some degree), to poor hygienic habits (promiscuous expectoration) and to an inadequate economic situation for large elements of the population.

Leprosy was fairly common, was shunned as a venereal disease by the general populace, and the public health attitude, as far as I could observe it in that Japanese-occupied area during the years I was there, was a complete ignoring of the problem.

Carcinoma of the breast was quite common. The patients usually presented themselves for treatment after the disease was quite far advanced, but even palliative surgical excision gave in many cases good healing and relatively good health for several years.

Bladder stone was very common—kidney stone rare.

Epidermophytosis of the feet was so common in that area that it was known in both English and Chinese as "Hong Kong foot."

Appendicitis occurs, but seems to be a little less prevalent than in America. Placenta previa, ectopic pregnancy, benign and malignant uterine tumors, ovarian cysts and cancers were seen with a frequency comparable to that prevailing in America.

Typhoid was prevalent, and cholera fairly common. The dramatic character of the collapse from cholera, and the miraculous appearing response to intravenous saline is very impressive to a newcomer.

The Japanese authorities vigorously vaccinate the populace against smallpox and give them an inoculation of killed cholera bacteria every three months. Some of the more well-to-do Chinese avoid this "nuisance" by hiring a coolie to take the "shot" for them, then turn over the certificate to them.

PART III.

NOTES ON THE HEALTH SITUATION IN AN INTERNMENT CAMP UNDER THE JAPANESE

For nearly a year after the war in the Pacific began, we were allowed to continue our work in the hospital almost unmolested. Then, in November 1942, we were told that "because of the cruel and inhuman treatment of Japanese in America" it would be necessary to intern all enemy nationals in Japanese-controlled areas. At first all men under 45 in the Canton area (Americans and British) were placed in a camp (actually a former mission compound) under guard and supervision of the Japanese army. Our food was furnished by the army, supplemented by vegetables raised in the garden on the compound, and by purchases which we were able to make through the sergeant in charge, by means of funds which we had brought with us, plus a loan of eight U. S. dollars per month per person obtained from our government through the Swiss consul in Canton, acting as an intermediary power. Being able to eat rice three times a day for months on end, and with the diet supplemented as described above, we suffered no deficiency, on the average, for this six and one-half months period. The only major illness during that time was when one of our fellows developed acute appendicitis. After some hesitation and red tape, he was finally removed from the camp in

the custody of a Japanese army doctor, taken to a military hospital, and the appendix removed. Fortunately this man was the one internee in our camp who knew how to speak Japanese. The surgeon asked him if the appendix of a white person was the same as that of a Japanese, as he had never before operated upon a white man. The operation was done under local, but the patient says that he noticed little or no anesthetic effect. On the sixth day postoperative he was returned to us at the camp. During that interval he had had no bath, and nothing had been done to disturb the bowels, either pre-operatively or postoperatively. Yet his recovery was uneventful. I was reminded of Dr. J. M. T. Finney's statement in his autobiography, *Surgeon's Life*, that he always heaved a sigh of relief when he and his family left Germany after a visit, that they had not had to have any surgery done in that country. Not that their operating ability was not great, but that their consideration for the comfort of the patient was so slight. Well, Japan has been a great student of Germany, medically as well as militarily. They say that we are soft and degenerative, while they are vigorous and "can take it."

Later we were moved to a camp in which our families and others than men of military age had been placed. Here the food was also plentiful, but, though probably luxurious by Japanese standards, was hard to take by some of more delicate appetite, so that some cases whose normal weight was 140 pounds or so, lost 40 or 50 pounds over a few months. Food furnished, if inedible, is thus in effect insufficient. Doctors and dietitians from some of the other larger camps in Japanese-controlled areas, where food ration was stricter, said that about 1800 calories per person per day was furnished. In some cases, especially in the Stanley camp in Hong Kong, beriberi and other deficiency states, as well as marked loss of weight, were common. Vitamins and other supplies sent

by the Red Cross helped to alleviate this situation at least for a while.

One death occurred in our camp—unavoidable—due to cancer of the stomach, with metastases. We doctors in the camp had first-aid supplies which we had brought with us. When the condition was suspected in the man above mentioned, the camp authorities made arrangements for him to be taken to a nearby hospital in charge of a German doctor. He also was allowed consultation by a capable Chinese surgeon from the Hackett Medical Center. (Otherwise we were allowed no contact with the Chinese after we entered the camp). He was given the choice of remaining at the hospital or returning to the camp. His wife was in the camp and he elected to return. When he died, arrangements were made for an autopsy, cremation, and the ashes are in care of the Swiss consul for burial after the war.

SUMMARY

1. Malaria was discussed, pointing out its increasing appearance in this northern area of the United States, the importance of its recognition, the effect which it is said to have in occasionally causing the serology to appear positive for syphilis, the danger of spreading malaria by blood transfusions, and the possibility of its transmission by mosquitoes in this area. A plan of treatment is given, and toxic effects, especially in overdosage, warned against.

2. Several diseases that came to attention in South China are listed, with brief discussion.

3. The food situation, and other factors affecting health in an internment camp under the Japanese are discussed briefly.

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Roseola Infantum

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INTRODUCTION

IT is not an outmoded custom for people to boast of the fact that they have been placarded for measles oftener than their neighbors. To date my former neighbor rules the roost with the impressive admission of eight separate attacks of measles for her oldest child (the last one undoubtedly due to an overdose of strawberries). While the physician can not always be held accountable for such a "jackpot" of contagion in one family, he is frequently at fault for errors in diagnosis. Perhaps he is overcautious and feels it is his duty to protect the community. More likely he has given a hurried "shot in the dark" diagnosis to cover up his ignorance of the cause. Regardless of his excuse, it is still not excusable. With many families the parents are educated

enough to realize that measles, like lightning, doesn't strike in the same place very often; and they object to the internment of their child for any one contagious disease on more than one occasion, sensing that at some time their doctor made a mistake in the diagnosis.

Perhaps the error goes back further than that, even to medical school. Personally I was a little too full of pityriasis rosea when I graduated and not saturated enough with unimportant allergic, toxic and mild infectious rashes which are as common as mud and just as confusing. Morbidity and mortality do not always justify importance. "Bread and butter" medicine depends upon the recognition and treatment of common and many times insignificant afflictions.

In this category one must include roseola infantum,



Roseola Infantum rash on trunk.



one of the most forgotten, least appreciated and commonly misdiagnosed contagious diseases. I have seen well over two dozen cases during the past year and have received histories by the score of previous attacks of "measles" in children who without a shadow of a doubt were victims of this mild exanthem and a physician's unawareness. A review certainly is in order.

ROSEOLA INFANTUM

Roseola infantum is an acute contagious disease found almost exclusively in infants and young children. It was first discovered in 1910 by Zahorsky,¹ who gave it the above name, meaning "the rose rash of infancy." It is also known as exanthem subitum, or the "unexpected rash." Both titles would seem appropriate.

The disease is very common, reportedly having an incidence not quite as great as for measles or chicken pox.¹ Although endemic in character, I would be prone to believe the incidence is at least comparable with these contagious exanthems were it correctly diagnosed. It has been called measles, scarlet fever, toxic rash, heat rash and eczema to my knowledge, and a few more could probably be added could we but listen in on the consultations. At times, in institutional outbreaks, it becomes epidemic in character² and the course of the disease may be altered considerably when appearing in this form.¹ There is no sex predilection. Age is the most important predisposing factor in that 95 per cent of the cases occur under the age of 2½ years and 75 per cent between the ages of 6 and 18 months.¹

No specific etiologic agent has been discovered but it is assumed to be infectious and mildly contagious. The mode of spread is unknown. The incubation period is probably from eight to fourteen days.²

There are no prodromal symptoms. The disease is usually ushered in by a fever which develops suddenly and remains elevated for two to five days. Almost any symptoms accompanying fever in childhood may be present—convulsions, vomiting, colic, listlessness, fretfulness,

anorexia, etc. There may be a mild coryza or cough. The fever which is characterized by morning remissions not infrequently reaches 105 degrees in the more severe cases. As the disease terminates, there is a critical fall in the temperature, and as the temperature drops or within twenty-four hours after the return to normal, the eruption makes its appearance.

This eruption is typically rubelliform and is fully developed within two to twenty-four hours. It appears on the abdomen first and rapidly involves the rest of the trunk. The face, forearms and legs are usually spared. In general the rash is difficult to distinguish from German measles. The lesions are rose-red macules, 2 to 3 mm. in diameter and at times slightly elevated. They are likely to be sparse but in the more severe cases may be profuse enough to coalesce. Immediately after the rash has fully developed, it begins to fade and almost invariably disappears completely within two days' time. In a few cases the rash is so transient that it could be easily missed. Such cases lead to the deduction that an eruption need not necessarily be present, and it is not too uncommon to care for cases which fulfill all the criteria for the diagnosis including laboratory data and yet never show the least trace of a rash. Naturally any conclusion here is purely speculative.

Laboratory data is not conclusive. Early in the pre-eruptive stage there may be a mild transitory leucocytosis. Following this, however, the count rapidly returns to normal or develops into a mild leukopenia which is characterized by a relative lymphocytosis. Barenberg and Greenspan³ found this blood picture so uniformly constant that they believed it might be of definite aid in the diagnosis of modified forms of the disease. Counts performed in my own practice among endemic patients do not bear out this uniformity.

During the course of the disease a number of infections must be excluded. In the pre-eruptive stage almost any disease producing a prolonged remittant fever must

be considered. Two clues suggest roseola infantum at this stage:

1. The child does not appear critically ill in spite of the high fever.

2. There is almost a complete absence of abnormal physical findings.

In the eruptive stage only measles and German measles are apt to cause confusion. In measles the rash almost invariably breaks out at the height of the fever and the temperature falls by lysis after the appearance of the exanthem. Koplik's spots and severe coryza are the rule. German measles produce little or no fever and in a majority of the cases the eruption is the initial sign. There is enlargement of the occipital and posterior cervical glands. German measles is almost invariably an epidemic disease.

Complications or sequelae to roseola infantum are almost unknown. Treatment consists entirely of attempts to control the fever and irritability with aspirin, sponge baths and sedatives. Management of parental anxiety during the pre-eruptive stage seems to be the greatest task.

The following case summaries and charts illustrate the typical course of the infection and the confusion that might exist.

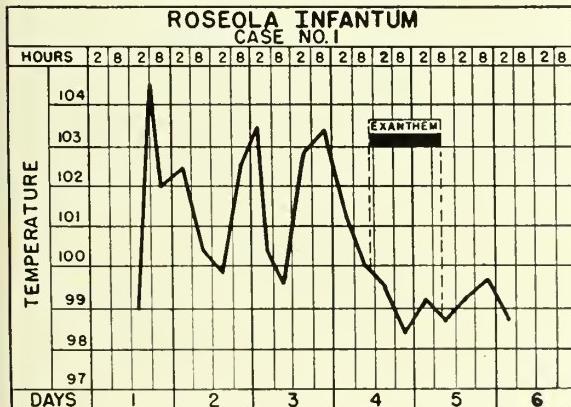


Fig. 1.

Case 1. A boy, age 2 years, developed a rather sudden fever of 104.5° (fig. 1) in the late afternoon. His mother was under treatment in the hospital at the time because of a severe streptococci throat infection. The child had had no contagious diseases. Physical examination revealed only a questionable mild pharyngitis. He was hospitalized and started on 3 1/4 gr. of sulfadiazine every four hours. Admission w.b.c. was 8,400. Polymorphonuclears numbered 65 per cent and lymphocytes 35 per cent. On the following day there were no abnormal physical findings and the sulfadiazine was discontinued. On the morning of the fourth day the temperature dropped to normal and he broke out with a light pink macular rash, limited entirely to the trunk. The rash faded within twenty-four hours. Symptomatic improvement was immediate.

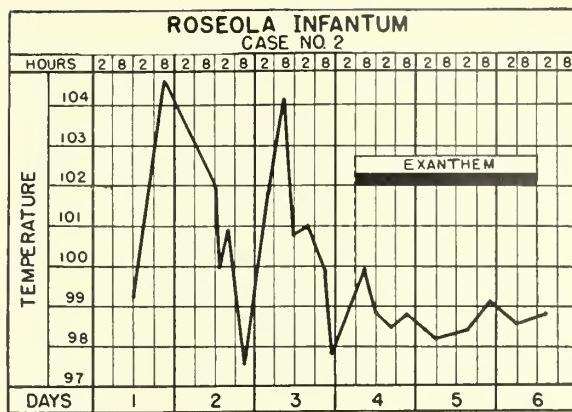


Fig. 2.

Case 2. A baby boy, age 11 months, was examined during the early afternoon in the course of a monthly well-baby visit. There were no abnormalities except for a mild seborrheic eczema of the scalp, forehead and upper face. At 8:00 P.M. on the same day the baby's temperature rose suddenly to 104.6° (fig. 2) and he became extremely irritable. Re-examination on the following morning revealed no cause for the fever. The w.b.c. was 8,000 with polymorphonuclears numbering 60 per cent, lymphocytes 38 per cent and eosinophiles 2 per cent. Hospitalization was effected. Only symptomatic treatment for his fever was ordered. On the evening of the third day the temperature dropped to normal and the following morning the nurses noticed a macular rash, prominent over the abdomen and back but also present on the lower face and upper arms. The seborrheic eczema in the meantime had almost entirely disappeared. The roseola rash faded slowly but was not visible by the end of the second day. The baby's disposition improved remarkably after the exanthem appeared.

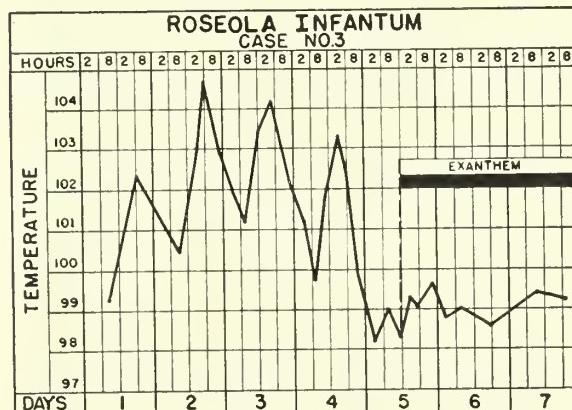


Fig. 3.

Case 3. A baby girl, 1 year old, was examined one evening because of the sudden development of a fever, anorexia and irritability. Past history was negative. Physical examination revealed no cause for the symptoms. Rectal temperature was 102.4° (fig. 3). She was given aspirin and phenobarbital and the temperature dropped during the night but rose to 104.8° the following after-

noon and she was hospitalized. Re-examination for three consecutive days gave no hint as to the cause of the fever. There was no coryza. The w.b.c. ranged from 9,000 to 12,000 and the differentials were just as uninformative. The baby was extremely fussy and refused all solid foods. On the afternoon of the fourth day the temperature dropped by crisis and almost immediately a rather dense maculopapular rash appeared on the entire trunk, face and proximal extremities. The rash on the face and extremities disappeared in twenty-four hours but on the trunk it was visible for almost three days. It was the heaviest, most persistent roseola rash I have ever seen. The humor of both the parents and baby showed progressive improvement following the appearance of the exanthem.

CONCLUSION

Roseola infantum is a common mild exanthematous contagious disease which runs quite a constant and characteristic course. Its recognition is rather simple once the practitioner is aware of the fact that there is such a disease entity and has acquainted himself with the chief clinical features.

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Minneapolis Academy of Medicine

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NEEDLE BIOPSY OF THE LIVER

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Attempts at needle biopsy of the liver have been made by many investigators since the original studies of Lucatello¹ in 1895. Various methods were employed using various sized needles; small bits of tissue were secured by means of suction applied during the advancement of a needle into the liver. This method has been eminently successful in the hands of a group of Danish investigators (Iverson, Roholm, Krarup²). They describe a posterior lateral approach, and employ a needle with a serrated cutting edge. Their contributions to our knowledge of the histopathology of the liver have been outstanding. Using this same technic, Dible, McMichael and Sherlock³ have recently studied the changes in epidemic and other forms of hepatitis. In 1941, Tripoli and Fader⁴ proposed the use of the Silverman needle for the purpose of liver biopsy. They advocated an anterior approach, entering the liver beneath the costal margin at the lateral edge of the right rectus muscle.

On the medical service of the University of Minnesota hospitals, the method described by Tripoli and Fader has been employed for the past two years. The procedure is carried out under local anesthesia at the bedside. If one is careful to anesthetize the parietal peritoneal surface the procedure causes little discomfort to the patient. Entrance into the liver can be detected by noting movement of the needle coincident with respiration. Usually one obtains a piece of liver tissue one to two centimeters in length and approximately 0.8 millimeters in width. This is adequate to prepare routine stains as well as special stains such as for connective tissue, iron, or glycogen. Serious bleeding from the site of the needle puncture in the liver has not been encountered. On the basis of experience to date, 65 cases, it is felt that the method can be safely used in the presence of an enlarged and easily palpable liver. It is not recommended when the liver is of normal size.

To obtain a liver biopsy in the absence of hepatic enlargement, the procedure of laparoscopy is resorted to. Because of the criticism of subcapsular biopsy of the liver, as obtained by the forceps attachment of the Ruddock peritoneoscope, we have employed a modified Silverman needle to secure liver biopsy. This needle, 18 centimeters in length, is similar to the Vim-Silverman needle which is 8.5 centimeters in length. With the peritoneoscope in position and the liver under visualization, the needle is inserted through the anterior abdominal wall and guided into the liver. This method offers the advantage that the

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biopsy site can be selected, and the danger of the biopsy needle entering bowel or gallbladder eliminated. In the presence of carcinomatous metastases in the liver, the chances of securing a positive biopsy of tumor tissue is much greater than by the bedside method. It has the disadvantage that the procedure must be done in an operating room and is therefore more time consuming than the biopsy performed at the bedside. In a series of 20 cases this type of needle biopsy has been carried out. The results to date have been satisfactory.

In cases of hepatomegaly associated with cirrhosis, hepatitis, hemochromatosis, amyloid disease and metastatic carcinoma, needle biopsy of the liver, carried out at the bedside, has been most helpful in arriving at a correct diagnosis. In instances of pericholangitis hepatitis, simulating neoplastic or calculous obstructive jaundice so closely, liver biopsy has been almost essential for an accurate diagnosis.

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Discussion

DR. ORWOOD J. CAMPBELL: I have been extremely interested in Dr. Hoffbauer's method of biopsy of the liver. I am sure that he could not have introduced this technic at a time when it would be more readily accepted by the surgeon, than in these days when they are so overworked that they are glad to turn their cases over to the internists.

The liver is an organ which the surgeons have treated with a great deal of respect. It cannot be entirely removed, it is highly vascular and very friable so that suture technics are difficult.

Direct procedures on the liver are concerned with repairing lacerations, the occasional removal of a neoplasm, or the drainage of an abscess. Hemorrhage from a lacerated liver is profuse and the patients are usually in severe shock. However, with better facilities for transfusions it has been found possible to repair the damaged livers and save the lives of patients who otherwise would have died. There are very occasional cases

reported of cysts and certain neoplasms of the liver which have been successfully removed. Primary malignancies and metastatic malignancies, of course, are not amenable to surgical attack.

Liver abscesses may occasionally exist singly or as confluent abscesses in a localized area and thus lend themselves to surgical drainage.

I think Dr. Rigler's work in visualizing the liver and thus outlining the number and position of abscesses or tumor masses has contributed greatly in determining the operability and localizing the lesions which may be amenable to surgical attack.

I have had no experience with echinococcal cysts or amebic abscesses of the liver. Amebic abscesses lend themselves well to aspiration. Echinococcal cysts are usually treated by marsupialization.

The most common example of indirect attack on the liver is the relief of biliary back pressure and the consequent biliary cirrhosis. The removal of stones is a standard procedure. Shunting of bile through a cholecystostomy, or cholecystenterostomy has been the usual method of dealing with biliary obstruction due to malignancy, either in the duct itself or in the head of the pancreas. Technics for the excision of carcinomas of the pancreatic portion of the common bile duct and of carcinomas of the head of the pancreas are being developed and show promise of real success.

Another liver condition in which surgery is occasionally found helpful is cirrhosis of the liver with portal obstruction. Surgery in this condition is designed to relieve the strain on the portal circulation. The most common method employed is the old and established Talma-Morrison operation in which the omentum is sutured to the abdominal wall and the under surface of the diaphragm and surface of the liver scarified to promote anastomotic connections with the systemic circulation. If this procedure is combined with a splenectomy the results are often times very beneficial. The ligation of the splenic artery will in itself reduce by 30 per cent the amount of blood which must return through the liver.

The eck fistula is rarely attempted for portal obstruction, both because of technical difficulties and because the patient does not tolerate well such a complete diversion of portal blood.

We surgeons welcome the more accurate diagnosis which both Drs. Watson and Hoffbauer are able to give us, thereby confining surgical procedures to those cases in which real good may be accomplished.

* * * * *

Dr. F. W. HOFFBAUER (in reply to question regarding serious hemorrhages): We have not had any serious hemorrhages from the liver itself. In one case, a large vessel was punctured by over-zealous plunging of the needle completely through the left lobe of the liver. This necessitated transfusions and subsequent operation for control of the bleeding. The patient recovered. This procedure should be limited to livers which are definitely large so that one could be sure that one were not entering the needle over two or at most three centimeters, and not go through a thin left lobe. I have had the opportunity to watch the congealing of the blood. It persists in bleeding for 30 or perhaps 60 seconds and then seals off. We have never used cautery. In the experimental laboratory on animals, where carbon tetrachloride has been used, I have never seen fatal hemorrhage occur, and we have never used cautery there. So that I feel where a single needle track is made of a bore no larger than the 14 gauge needle, the chances of hemorrhage are very slight. Naturally if there is a bleeding tendency, which is not clotted by giving vitamin K, or which does not respond to giving vitamin K, the possibilities are enhanced.

I know of only two instances of fatal bleeding, one from this country, in the case of a mediastinal lesion, where the patient bled to death. There are two or three reports of fatal hemorrhage from Bangle in Germany. The Danish investigators who used the portal approach report several alarming hemorrhages but no fatalities, and cautioned against the danger of hemorrhage. We have encountered one or two instances in which hemorrhage was a serious although not a fatal accompaniment.

In properly selected cases, serious hemorrhage from the liver has not occurred as a result of needle biopsy. In 20 instances in which needle biopsy has been carried out at the time of peritoneoscopy, the site of bleeding has been observed. Free bleed-

ing from the site occurs from 30 to 60 seconds and then closes. The depth to which the needle is inserted into the substance of the liver, 3 to 4 centimeters, avoids the larger hepatic vessels located at deeper levels.

I would re-emphasize the need for restricting the use of the bedside biopsy procedure to cases in which the liver is definitely enlarged, well below the costal margin. I have seen one serious hemorrhage occur in an instance in which this precaution was not observed. Needle biopsy of the liver was performed in an individual whose liver was but very slightly enlarged. The needle was passed completely through the thin left lobe of the liver and entered a large artery. The resultant hemorrhage was nearly fatal. After multiple transfusions, an exploratory laparotomy was performed. The surgeon removed a great deal of free blood from the peritoneal cavity. The hemorrhage appeared to have stopped; the abdomen was closed after removal of most of the blood. Fortunately the patient made an uneventful recovery.

There are several instances cited in the literature in which fatal hemorrhage has occurred following various types of liver biopsy.

It seems wise, therefore, to caution against undue enthusiasm in this procedure. In any instance in which the safety of the procedure is in question, peritoneoscopy would appear to be the method of choice.

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Dr. S. R. MAXEINER: I think the advances that have been made recently in physiology and physiological chemistry have been astonishing. I have a son who has just completed his freshman year at the University and his teaching far exceeds anything that we had when I was in school. It should be a great help in both diagnosis and therapy.

About a month ago I operated on a patient with a gradually increasing jaundice at which time a carcinoma of the ampulla of Vater was found. The common duct was ligated, the gall-bladder anastomosed to the jejunum and the distal portion of the stomach, the first, second and third portions of the duodenum together with the ampulla and head of the pancreas were removed en masse. A Polya anastomosis was done between the cut-off end of the stomach and the small bowel. After removal of the head of the pancreas the remaining portion was ligated and no effort was made to establish continuity between the pancreas and the bowel. For a time there was complete obliteration of pancreatic excretions but recently he has developed a persistent pancreatic fistula. The patient did well for a time without any pancreatic juice but he subsequently began to fail and his pancreatic juice was restored to his digestive tract through a duodenal tube.

It has been shown experimentally and clinically that humans can do without a pancreas but in this instance the patient was greatly improved after his juices were returned to his digestive tract.

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Dr. J. S. McCARTNEY: I have had a lot of fun with these needle biopsies from various sources, not only from the liver but I have had some from the prostate and from the thyroid, and so forth. Ordinarily Dr. Hoffbauer has given me no clue at all as to what he was thinking about. He has merely sent me a piece of the liver and let me go to it and he would tell me afterwards whether he thought I was right or wrong; and it has surprised me sometimes what I was able to tell him. It looks like a small bit of tissue that you get. Dr. Hoffbauer said in his talk that it was 1 cm. in length and $\frac{1}{2}$ cm. in width, but it is actually 1 or 2 mm. in diameter. It is small but in many of these biopsies we have a strip of liver that shows us anywhere from possibly eight to twenty lobules, so you can see we get a view of the portal veins, and can compare the various portal passages which are present in the field, note the distribution of the bile and the biliary pigment that is present, the degree of infiltration, the relative amount of connective tissue in the portal passage, and in some of these cases of pigmentary cirrhosis it tells us enough to get as good an idea of the distribution through the lobule as from a piece a square centimeter in size which we ordinarily take from a liver at post mortem. We don't, of course, get any idea as to the relative size of the nodules as we do at post mortem, but we do get plenty with a

favorable biopsy to tell quite a lot as to what the probable future of that liver is going to be.

* * * *

DR. MOSES BARRON: I think that Dr. Watson has done more to clarify conditions of the liver obscured by jaundice than any man that I know of in medical literature. He has opened up new fields in diagnosis by making certain types of what he calls screening profile tests. By using his methods of evaluating the amount of certain products of bile pigment urobilins we find in the urine and in the feces and comparing it with the normal and with each other, we have been able to determine fairly accurately when these studies are made as to whether the condition is one that denotes melanemia, a stone, or hepatitis.

I saw a very interesting presentation of this work done in Duluth. Dr. Tuohy and Dr. Hirschboeck have taken up the work that Dr. Watson has been showing, in that they have made extremely interesting studies of each case of jaundice and then put down those figures as he has here, to get a composite idea of the situation, and in this way they have arrived at diagnoses which might otherwise not have been possible. Dr. Tuohy was highly complimented at the last meeting of the society at Hibbing because of the ability that they have developed in arriv-

ing at correct diagnoses. I think that with what Dr. Watson has done we ought to see if our hospitals can't be induced to make these studies. The deduction seems at first complicated but I think that if we would get the idea across to our laboratories and tell them just what is needed, I know Dr. Watson would help them greatly in suggesting the procedures to follow.

Even the master himself faces difficulties. This presentation tonight goes to show how extremely complicated the whole problem of liver disease is with respect to diagnosis, and especially to form conclusions as to jaundice. Some of the tests usually agree and some will vary, the same as the index. I think that the van den Bergh index allows much for differential diagnosis and many of these tests can be made even in the clinic, the laboratory, or even at the bedside by the practicing physician. What Dr. Watson has done tonight should induce all of us to see if we can make available these various tests in order to obtain these additional clues to our diagnoses. We know that we can get a great deal from physical examination, and can in fact gain even more from the history, but when it comes to many of these cases, the best of us cannot arrive at diagnoses without the help of our laboratories, and so that we may more accurately diagnose liver diseases we must try to persuade our larger hospitals to institute these procedures.

DECEMBER 18, 1944, SYMPOSIUM ON ALLERGY

OPTHALMOLOGY ERLING W. HANSEN, M.D. Minneapolis, Minn.

It may be surprising to think that there is much of allergy connected with the eyes but it is quite a field. I will skip over more or less the skin reactions in the lids because Dr. Laymon will discuss skin lesions. I will call attention to the fact that we do have a great many people who suffer with blepharitis marginalis, which involves the margin of the lid and which in a great many instances turns out to be sensitivity to some type of allergen. Angioneurotic edema causes patients to come in scared to death, their lids all swelled up. This sudden type of angioneurotic edema may be due to contact with drugs, particularly with atropine. Whether these are true allergens, or not, there is certainly hypersensitivity in the tissues. Another cause may be contact with various types of pollens, the type of thing that we have in hay fever, bacterial toxins especially staphylococcus, or to dust sensitivity, or even to food allergies. Some of the cases of blepharitis that I have seen were definitely shown to be due to such foods as eggs, chocolate, milk, and peanuts, etc.

In addition there is involvement of the conjunctiva and cornea which is due to the same type of irritants, and one that we are all familiar with. I don't think anyone will gainsay that the reaction we get from hay fever is due to allergy. Most of the allergic reactions we get externally in the eyes are manifested by intense itching and by mucous secretion rather than by purulent secretion, and by sensitivity to light. In some of the youngsters it is difficult to get the eyes open to examine them.

In addition to these more common things, we have some specific entities such as phlyctenular conjunctivitis, mostly at the limbus and sometimes on the cornea, or both. They for the most part, are due to sensitivity to tubercle toxins, and we see them not so much in cases of open pulmonary tuberculosis as in those people who show some gland involvement. We used to see it with glands in the neck, probably more of the bovine type than the human type of tubercle bacillus, but we do see them also in people who have recovered from tuberculosis, and we see them in attendants at the sanatoria, usually showing positive skin tests and hilar glands. The lesions are just accumulations of lymphocytes, never showing tubercle bacilli. The surface breaks down, causing a shallow ulcer. Sometimes we have a fascicular lesion advancing across the cornea, new blood vessels following in the wake of the advancing ulcer. This interferes with vision because of the superficial scar which follows this particular lesion.

Another condition that should be mentioned particularly in connection with conjunctivitis is vernal conjunctivitis, so-called

because of its appearance in the spring and summer, and due probably in most cases to tree pollens and the earlier grasses. I remember one patient, however, in whom this typical lesion could be produced by eating chocolate. Flat follicles can be seen under the lid, and the condition is characterized by marked itching and photophobia, mucous secretion, and eosinophiles in the secretions. These symptoms usually clear up in the fall and winter, and usually occur in persons 5 to 15 years of age. Sometimes a similar lesion to that seen in phlyctenular conjunctivitis, occurs at the limbus. We have therefore two types of lesions, the plaques on the under surface of the upper lids and the involvement of the conjunctiva at the limbus. After several seasons the plaques on the lid become permanent and may cause irritation to the cornea. It is sometimes necessary to strip the conjunctiva from the lids.

The lens too may react to allergies with resulting cataract. In cases of generalized dermatosis, or so-called neurodermatosis, cataracts are seen in a fair number of patients. This is not so strange when we remember that the lens is formed from ectodermal tissue; the lens vesicle invaginates from the surface ectoderm, is pinched off and thus it is an actual ecto-dermal structure. This type of cataract is found usually in young people.

The iris, ciliary body, and the choroid may become sensitized unquestionably to an infection. Then in recurrent or chronic infections with the same organism there is an allergic reaction. When toxins in the circulating fluids come in contact with the iris, for instance, the iritis lights up.

Interstitial keratitis usually occurs in children 5 to 15 years of age and is due to congenital syphilis in at least 90 per cent of cases. While there may be direct invasion of the cornea by the spirochete, most of these cases are due to sensitization in uterine life, the corneal involvement appearing in the age group in which we have several other types of allergic manifestations. This severe inflammatory reaction takes place, not superficially but in the deeper structure of the cornea. Blood vessels invade the otherwise avascular cornea. This vascularization and the infiltration cause a marked interference with vision, some of which clears up in time. Finally there is no longer blood in the vessels which however persist, leaving a network which can always be seen with good illumination and especially with magnification. A few of these cases arise from acquired syphilis later in life, and a small percentage are due to tuberculosis. Wessely in Germany has shown that this lesion can be produced by experimentally sensitizing the cornea with foreign sera.

We have two specific conditions which may involve the interior of the eyes: a) the one due to sensitivity to lens protein in which we see a very severe inflammatory reaction in a second eye, and in some cases, where a cataract has been removed from the other eye, so-called endophthalmitis phaco-anaphylactica.

Apparently the tissues become sensitized to the lens proteins or fractions of the lens protein which are present. This has been worked out particularly by Verhoeff in Boston. Sometimes it occurs also in needling operations on congenital cataract. Here we sometimes have to do a dissection several times before complete absorption of the cataractous lens and it is on the second or later needlings that reaction occurs. b) The other condition is sympathetic ophthalmia, almost entirely due to injury of the ciliary body and to disturbance of uveal pigment. Here we have in the second or sympathizing eye the same type of lesion we have in the injured eye when that has developed a uveitis. It has been shown by Elschnig and Woods and others that uveal pigment can act as an antigen and presumably is the tissue involved. There is probably some other factor that enters into it besides the pigment itself but the fact remains that it is almost always in those cases where there is pigment disturbance in the uveal tract. The area of the ciliary body is the so-called danger zone. When injuries take place through this region, we get the so-called sympathetic ophthalmia; fortunately this occurs in only a small percentage of cases.

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USE OF THE PASSIVE TRANSFER OR INDIRECT METHOD OF SKIN TESTING IN ALLERGIC DISEASES

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One of the inherent fallacies of medical men is their delay in recognizing the value of procedures which sometimes, with less effort, would enhance their ability to diagnose and manage diseases daily met in their practice.

Direct skin testing for so-called atopic allergy was introduced by Blackley.² Later the intracutaneous (also known as the endermal or intradermal) method was used to augment the scratch test. The limitations of both are now well established and yet this procedure is used solely by many when determining hypersensitivity.

It is a generally accepted idea that a positive skin reaction elicited by the direct method of testing indicates that clinical sensitivity to a reacting substance has existed, exists presently or is developing. However, there is reason to believe that some skin sensitivities never were or never will be of clinical significance.

Statistical studies of allergic and nonallergic persons indicate that specific sensitization frequently resulted only in antibody formation in the skin instead of the internal organs. Since the skin test is specific for skin sensitization, the conclusion is that the skins of at least one-fourth of persons without allergic symptoms of any kind develop antibodies as a result of frequent contact with the allergen, particularly foods. A properly controlled direct skin test always indicates skin sensitivity but not always clinical sensitivity.

Also, in certain diseased states, which are not allergic in nature, unaltered protein may enter the circulating blood through the gastro-intestinal tract and reactions may occur subsequently, but are usually transient.

Collected statistical studies by Alexander,¹ from many observers of over 30,000 direct tests done, showed that patients with certain allergic diseases developed positive reactions with the following frequency: Hay fever, over 90 per cent; bronchial asthma and vasomotor rhinitis, less than 60 per cent; gastro-intestinal allergy, less than 25 per cent; urticaria, about 5 per cent. According to Rinkel³ only about 20 per cent of the foods giving positive reactions by direct skin testing are actually the cause of allergic symptoms.

Allergic patients show local hypersensitivity in few shock organs. A patient with bronchial asthma may have his antibodies deposited only in the bronchi and none in the skin, in which case the skin will not react.

A skin sensitizing antibody will be present in the blood only when the skin test responds to the specific antigen (allergen), although not all positive skin reactions produce antibodies in the circulating blood. These antibodies are deposited first in the local tissues, and after the latter become saturated, they escape into the blood stream.

It is reasonable to conclude that any specific excitant, capable of stimulating such antibody formation to excess, is one which

is more likely to be contacted frequently and be responsible for clinical symptoms. Furthermore, reagins or antibodies, which occur in the circulation of clinically nonallergic persons, are transient. This latter group is allergic immunologically, or they would not have reagins in their blood. They may be, and often are, clinically nonallergic.

Once these reagins or skin sensitizing antibodies are in the circulation, they are easily demonstrated by the passive transfer or indirect method of skin testing.

Twenty-three years ago Prausnitz and Küstner⁵ reported transfers of sensitization to nonallergic individuals, and in 1924 Matthew Walzer⁸ introduced it into the routine of diagnosis.

The passive transfer reaction has the advantage over the direct skin reaction because it affords more nearly perfect controls. Simon⁶ advocates the use of three controls:

1. *The Transfer Control* consists of an injection of the extract into a skin site not previously sensitized with reagin-bearing serum. The site may be a normal skin site or one injected with the serum of a nonsensitive individual. Make injection with the same volume and at the same time as the sensitized site with the same syringe.

2. *The Specificity Control* consists of an injection of the extracting fluid or some other allergenic extract, other than the one being investigated, into a sensitized skin site. The above tests give no evidence concerning the syringe. Thus a "mechanical" wheal is produced for comparison which proves that mere fluid or some other allergen will not produce a positive reaction.

3. *The Syringe Control.* Simon has shown a syringe control is necessary because of the problem of syringe contamination. He suggests either previously unused syringes are necessary or the cleansing thoroughly of syringes by acceptable methods such as proposed by Small, et. al.,⁷ or by the author.¹⁰

Properly cleansed and sterilized syringes with attached needles are partially filled with the extracting fluid and 0.01 or 0.02 cc. is injected into sensitized and nonsensitized skin sites. The reaction in both must be equal and negative, and the syringe acceptable only for transfers involving the serum which has been tested.

The procedure of Prausnitz and Küstner⁵ consists of injecting intracutaneously 0.1 cc. of the patient's serum into a normal or nonallergic individual; and twenty-four to forty-eight hours later, 0.02 cc. of the specific allergen, which produced a positive skin test, into the area of the previously sensitized site, as well as into a control area of normal skin. This is preferably done on a similar or symmetrical type of skin. The tests are best performed on the back in vertical columns so that those on the left of the back represent the patient's and those on the right represent the recipient's reaction as a negative control. Scratch tests can be performed on the sensitized site but are less desirable, as they cause some trauma and increase the refractory state.

If the patient had reagins of the specific excitant in his serum, the sensitized site would develop a positive reaction. In general, when a patient's serum contains the offending reagin which shows after a previous positive scratch test, the control site should show no reaction, and the patient has the same percentage of chances of being clinically allergic as formerly cited for direct testing with the advantage of revealing clinical sensitivity in a majority of allergies unsuitable for direct testing. If the control site also becomes positive, it would indicate that the recipient is sensitive as well to the allergen tested for, or that the solution is irritating. However, the recipient can be tested by a preliminary scratch test with the same specific excitant. When the test is unsatisfactory, another recipient is used. The area of the recipient so sensitized usually loses its sensitivity entirely in the matter of two to three weeks. The degree of reaction in the recipient is similar to the skin reaction of the donor and may be recorded as negative, slight, moderate or marked. A questionable reaction may be repeated with stronger dilutions, or direct tests on the patient may be repeated.

Any increase of redness or wheal is considered positive. If there is no difference in the size of that of the control, it may be due to a refractory skin, and the tests should be repeated in a fresh skin area. Any slight or doubtful reaction is significant if it occurs on repetition. Reactions are seldom as marked as by the direct method of testing. They also develop more slowly,

reaching a maximum within forty-five minutes; but it should be observed from ten minutes after the injection, and on.

The chief indications for performing the test as indicated by Walzer⁹ are:

Abnormal skin conditions of the patient, including:

Acute and chronic allergic eczemas (children and adults). Ichthyotic skins and those scarred by constant irritation (scratching and inflammation).

Urticaria (angioneurotic edema).

Marked dermatographia.

Concomitant contagious skin infection (pyodermas).

Diffuse skin eruptions (acne, psoriasis, etc.).

Hyperirritability of the skin, as in babies.

Constant and severe asthma necessitating almost uninterrupted use of epinephrine.

Cases of extreme sensitivity in infants and children when the possible development of severe constitutional reactions on direct testing are feared.

Suspected allergy in infants and children too small or too ill to be subjected to a long series of tests.

Antipathy on the part of the patient or his relatives to direct tests.

The inability of the patient to visit the physician or undergo a series of tests either because of disability, inconvenience or lack of time.

The desire to check the genuineness of an unusual number of positive skin reactions elicited by direct testing.

To these may be added:

The colored race.

Sunburn or a heavy coat of tan, or diffuse pigmentations.

It is best not to perform more than six or seven tests at one time, as the allergen may be absorbed sufficiently through the control site, reach the blood stream and cause a flaring up of the original sensitized site even if it has not been tested with the allergen. This phenomenon has been shown by Rudolph and Cohen,⁴ and others, to be exhibited in the nasal mucosa, and Walzer⁹ and others have shown that the allergen may be absorbed from the digestive tract with normal digestion and also activate the passively sensitized skin site. For this reason, foods for which the patient is going to be tested should not be eaten before the test. This indirect method of testing has its limitations, especially when attempted by one not versed in special laboratory procedures. However, after several trials, it is much more simple than it would seem and is well worth trying.

Sterile technic is essential when obtaining blood from the arm, as in doing the Wassermann test. The blood is collected in a sterile centrifuge tube and kept in the ice box until a firm clot and a clear serum are obtained, and a Kline diagnostic test for syphilis is done, or the serum may be passed through a Seitz filter. If negative, an all-glass tuberculin syringe is filled with the serum free from red corpuscles, injected just as in any intracutaneous test, and the sites marked with a dot made by a skin pencil or ink one inch to the right of the injection. Twenty-four to forty-eight hours later the site is tested with the suspected allergen, just as is done in any endermal test. Its greatest advantage is testing patients with abnormal skins, such as those with eczema, hives or angioneurotic edema. The physician can perform the tests at his convenience and without discomfort to the patient, especially children.

A positive passive transfer reaction, when done with the procedure described herein, usually indicates active sensitivity, but not necessarily clinically, to the exciting agent involved in causing clinical symptoms. So far, it is the most reliable single test in allergy and has a much greater value than direct skin testing in the majority of allergic persons. It is not a complicated procedure, and after a little experience can be performed by a competent nurse or laboratory technician. Suitable nonallergic recipients for testing have been readily available, in the author's experience. All physicians would do well to use this valuable method of testing when applying proper allergy procedures to their practice or specialty.

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Discussion

DR. WITTICH: This talk was presented merely to emphasize the advantages of indirect skin testing under certain conditions when determining skin sensitiveness to allergens.

Since direct skin testing either by the scratch or intradermal method on patients with various allergic skin diseases is, as Dr. Laymon indicated, practically valueless, the passive transfer test assumes as much importance when testing unfavorable skins listed here as direct testing on suitable skins. It becomes extremely valuable when testing for inhalant factors and is at least 40 per cent valuable when testing for food offenders.

Indirect testing when properly performed as described indicates that the skin sensitizing antibodies of the wheal type have been formed in such quantities that they have saturated the fixed tissues and are spilling over into the blood stream. There is reason also to suspect that any antigen which is an excitant sufficient to produce antibodies in excess must be of greater clinical importance than one which does not. A passive transfer test becomes positive only when the skin gives a positive reaction on direct skin testing. However, when we consider over half of all allergic patients' skins are unsuitable for direct testing and may give false reactions, the passive transfer method is a highly accurate measure of the skin sensitizing antibodies.

It is true that occasionally a so-called normal or non-allergic individual may react to a food recently ingested in quantities sufficient to produce skin sensitizing antibodies but these reactions are transient and occasional when compared to the hypersensitive patient's reactions. Besides, this is easily obviated by eliminating the well-known food offenders from the recipient's diet for three days before the test and also doing preliminary direct skin tests on the individual beforehand.

Any physician properly applying allergic procedures to his practice is obligated to his patients to use every method of diagnostic approach at his command—first a careful history, second, skin testing (both scratch, intradermal and passive transfer), mucous membrane and conjunctival tests, elimination diets, individual food trial, et cetera. I have reason to believe that Dr. Matthew Walzer, who first applied the passive transfer as a routine procedure in 1924, still considers it a very valuable test when indicated.

I should like to comment on Dr. Erling Hansen's excellent paper on ocular allergy and ask him if he has reason to suspect retinal hemorrhages as sometimes being on an allergic basis. I have had two cases of such a nature. The one patient was a woman, age thirty-five, who had a series of retinal hemorrhages reducing her vision so that she is only able to distinguish gross objects and to walk unaided. Her sister was totally blind at the age of thirty-five. The patient also had a chronic perennial allergic rhinitis proven by cytologic studies, skin tests and food trials. Under elimination and hyposensitization measures, she can see just as well today as she did four years ago at her first consultation.

Dr. Scherer mentions gastro-intestinal hemorrhage. With our present knowledge of the allergic mechanism, that among other reactions there is arteriolar dilatation, increased capillary permeability and diminished blood coagulability, it is reasonable to expect hemorrhagic states, particularly when the vascular system may be the shock organ. Bleeding in gastro-intestinal allergy no doubt occurs more frequently than we suspect. Besides x-ray studies, the stools should be examined for blood as well as for eosinophiles in the mucus. Eosinophiles may be found at the height of the reaction. In all allergic states there is an eosinophilic response but frequently this is missed because the examination was not made during the eosinophile phase.

Also cases are cited by allergists where there is some evidence that progressive myopia may be on an allergic basis. There is frequently a positive family history of progressive myopia, and I know of two cases under allergic management where the progress has ceased and the same lenses have been worn for several years.

DR. WITTICH (in reply to Dr. Hansen's question as to what allergy is): Although there are certain missing links in the chain of evidence for the basic mechanism of allergy, our present day knowledge of many of its principles are fairly well known. In order to understand allergy, we must understand anaphylaxis and immunity and their close relationship, as well as the physiology of the autonomic nervous system. The evidence indicates that first there is an initiating antigen-antibody reaction, although some evidence has been offered that such a reaction is not necessary. We cannot take time here to discuss the secondary physiological, chemical and psychological factors influencing the allergic state, which includes temporary predisposition, such as gastro-intestinal disturbances, endocrine influences, fatigue, biologic and emotional factors. The inheritance factor, the nature of allergen and the influence of environment all must be taken into consideration. The specific reaction, with the stage thus set, occurs when the offender comes along, whether it is something we eat, breathe in or contact, and the interaction of the antigen or offender and the antibody produces at the site of the previously sensitized cell in the shock organ stimulation of the parasympathetic fibres through the mediation of acetylcholine present and controlled by "choline esterase." There is a resultant cellular disruption through an unknown mechanism with the incidental or primary liberation of histamine. At this stage our concept has been greatly influenced by the work of Code in experimental anaphylaxis. The normal blood histamine is for the most part contained in the white cells, particularly the eosinophiles. It was found that by far the major portion of the histamine during shock passed from the white cell layer to the plasma where it is free to act physiologically. Code's observations have led him to certain definite conclusions concerning the role of histamine in anaphylactic shock. The amounts of histamine liberated during shock were sufficient to explain the fall in blood pressure. However, if the animal survived the initial shock, the blood histamine rapidly decreased to normal values. He observed that dogs die of anaphylaxis in two states of the reaction. There may be an "explosive" histamine release which floods the circulation causing irreparable capillary dilatation, which is irreversible, and quick death ensues; or the animal may recover from the first stage of the reaction with return to normal of blood histamine values and an approaching normal blood pressure. However, Code observed that "later some animals even with a normal blood histamine may sink into profound shock and coma and die with a normal blood histamine." Also, it was noted that histamine is not responsible for the decreased coagulability of the blood so characteristic of anaphylaxis in dogs. Based upon the observation of Jacques and Waters (1941) that heparin is released from the liver during anaphylaxis and the observations of others (Watanabe 1931, Ojers, Holmes and Dragstedt, 1941), that the greater part of the histamine released during the reaction also is derived from the liver, Code suggests that during the reaction there is a simultaneous liberation of histamine and heparin resulting from cellular disruption in the liver. He further suggests that there is another factor and not histamine which is fundamental in anaphylaxis and allergic reactions, and stresses that the sensitized cell damage is the responsible factor, with incidental release of histamine as a result of this cell damage. If the cell contains histamine in sufficient amounts and the animal is sufficiently sensitive to histamine, it may die as the result of a histamine death. On the other hand, dogs in anaphylaxis may die long after the blood histamine concentration has disappeared, as a result of cellular damage when histamine was incidentally released. Code points out that in allergic reactions in the dog there is the symptomatology of both histamine poisoning and heparin action. The action of these liberated disrupting factors is well known, and the pathophysiological responses, which are defense mechanisms set up, stimulate glandular activity with increased mucous secretion, act directly on the capillaries, increasing their permeability with the loss of fluid and electrolytes into the tissues, produce efferent arteriolar dilatation with hyperemia, and smooth muscle contraction or spasm, all which in turn produce the manifest allergic symptoms clinically recognized as bronchial asthma, hay fever, eczema, urticaria, angioneurotic edema, et cetera. The whole vicious circle is a local "axon reflex" and may occur in a localized shock organ area without cord influences. Many psy-

chiatrists wish to explain allergy primarily on a psychogenic basis, and not as a contributing factor, ignoring the antigen-antibody reactions. How can they explain the transference of skin sensitizing antibodies discussed here tonight or the production of the neutralizing or immune antibodies produced by the reaction?

ALLERGY IN DERMATOLOGY

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There are many reasons why dermatologists are particularly interested in allergy. Many manifestations of both cutaneous and venereal diseases are known to be based on allergic mechanisms. The skin also serves as an important test organ and it has many functions of defense which are related to allergy. One of the most important advances in the knowledge of the relationship of the skin to allergy was that of smallpox vaccination. Koch's experiments in tuberculosis and the studies of Bloch and J. Jadasson and their followers on allergic phenomena in fungous infections also stress the importance of the skin's capacity to react in the study of these diseases.

The skin is a tremendous organ and has been estimated to weigh over 3,000 grams in contrast to the liver, for example, which weighs between 1200 and 1600 grams. The skin is the principal organ which separates us from the outside world and has numerous protective functions against trauma, light, and bacterial and chemical irritants. If it were not for these protective mechanisms the skin surface would undoubtedly be continually covered with boils, warts, ringworm and countless other infections and the individual in all probability would succumb. Thus it seems logical to assume that the skin has important functions of immunologic protection and of allergic alterations.

Because of the accessibility of the skin, it serves as an important test organ in allergic studies. The skin can be seen, touched, scratched, scraped, irritated, tested, analyzed, and studied histologically at any time. The Schick, Dick, Schultz-Charlton, tuberculin and trichophytin are examples of important skin tests.

Since eczema of both the contact and atopic types and acute, subacute and chronic urticarias are encountered with great frequency in everyday practice, some comment should be directed to the question of the value of skin tests in these conditions. It is extremely important to make a correct diagnosis before any form of skin testing is considered. Practically all dermatologists have seen cases of lichen planus, scabies, and other "non-allergic" dermatoses which have been thoroughly scratch or patch tested. Even after the proper diagnosis is made, the selection of the proper type of test is important. For example, I have seen cases of contact dermatitis due to nail polish which have had dozens of scratch tests for foods and inhalants applied.

It is the consensus among dermatologists that scratch or intracutaneous tests with suspected, inhaled or ingested substances are of little value in atopic dermatitis in either infants, children or adults. The same may be said of acute, subacute, or recurrent cases of urticaria. In chronic urticaria, such tests are almost always of no value. Substances which may be negative on skin tests may be causes of clinical flare-ups, and substances eliciting strong positive reactions may be harmless on clinical exposures.

In contact dermatitis and drug eruptions of the eczematous type, patch tests with suspected agents are often of great value and may give significant information regarding the causative agent in many cases. Even in these cases, however, the competent dermatologist can expect to find and eliminate the etiologic agent in only somewhat over a third of his cases, but in the remaining two thirds, almost all will be benefited and many permanently relieved by correct topical therapy including the cautious administration of superficial roentgen rays.

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Discussion

DR. MALCOLM B. HANSON: One can see the multitude of manifestations of allergy. On occasional chest films we see localized shadows, with the patient having practically no pulmonary symptoms. These are due to transitory and localized instances of edema secondary to allergy.

DR. HERTZOG: In speaking of gastro-intestinal allergy, one might mention Henoch's purpura. This is a non-thrombocytopenic purpura that is considered to be anaphylactoid in nature. Abdominal symptoms may occur before any signs of skin purpura develop. It is not uncommon for a surgeon to explore these patients and find an urticarial hemorrhagic effusion within the intestinal wall.

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DR. HANSEN: There are a lot of other things that are suspected of being allergic manifestations in the eyes. With the time allotted we could hardly touch the high spots. The cases that Dr. Wittich spoke of, which we find in a fairly large number of young men in their late teens and early twenties, that of hemorrhage, usually in one eye, suggest the so-called Eale's disease. Some go on to blindness and some clear, and seem to have no further trouble after they reach their middle twenties. It is nearly always seen in males, but sometimes in females. These are cases of periphebitis, usually due to tuberculosis and had not heretofore been considered as allergic.

Also in the retina we have a macular lesion which is undoubtedly a vasomotor disturbance, an edema that sometimes goes on even to cystic degeneration, which Dr. Gifford, who was head of the department at Northwestern, termed central angiopathic retinopathy, and which Duke-Elder thinks may be of an allergic nature.

The important thing, I think, in any field is the recognition of the fact that we do have these conditions and that when they occur it is almost invariably when the individual himself or his family have manifestations of an allergy of some kind.

Another condition that is not strictly an eye affection but that we certainly see often enough, is the migraine type of headache. It seems to me that generally speaking the men who are seeing these patients from day to day don't recognize them as migraine cases. So many of them with a very definite migraine history come in for refraction before any other examination is made. From those whom I have checked, there have been excellent results in, I should say, at least one-third of the cases. There have been severe cases of headaches that were treated as allergic cases and were relieved when one item or another had been eliminated. That these headaches had nothing to do with the use of the eyes is indicated by the fact that these headaches sometimes came on in the night.

Perhaps many of you remember a case which was reported in the American Journal of Allergy about 1937. It was a very striking report of a nurse who had been having severe headaches and was reconciled to the idea of an operation to look for a brain tumor. A temporal decompression was done as a preliminary. Soon after, she developed one of her severe headaches. With this attack she showed a soft mass which herniated through the decompression area; apparently a wet brain. Then she was studied from an allergic standpoint and it was found that allergy was the basis of her trouble.

FEBRUARY, 1945

OPHTHALMIC MIGRAINE

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I have chosen to speak on the subject of ophthalmic migraine since it is encountered frequently by the ophthalmologist, although perhaps not always recognized, and yet is a part of a much greater disease entity seen in its protean manifestations by many of you in other fields of practice. I do not feel qualified to deal with the question of the cause or causes of migraine. From what I can learn there are perhaps many or multiple causes. Some of the various causes that are advanced are allergies, psychic disturbance, physical influences such as variations in heat and pressure, fatigue, and others such as endocrine imbalances. The mechanism by which so many and varied etiologic factors may lead to a similar result seems to be unquestionably a vasomotor imbalance within the cranium and in the brain substance itself. Whether this is vasospasm or vasodilatation may yet be open to argument. Perhaps some of you may have a word to say on this. The therapy of migraine similarly is in somewhat of a state of disorder. Naturally if some definite cause for an individual case can be demonstrated, treatment of

that cause may prove satisfactory—some of the cases apparently caused by allergic sensitivities respond well when the offending allergen is avoided. But many others are of such non-specific origin that treatment is often empiric. Dr. Horton of Rochester in his work in recent years on histaminic headache has perhaps removed from the grab-bag group a certain number of persons with headache which has been in the past classified with the migraines. I do feel sure that treatment directed at the eyes—principally correction of refractive errors and muscle imbalances, is not an effective cure for migraine, whether ophthalmic or otherwise, although such corrections if they reduce the nervous strain or tension under which the individual operates, may reduce somewhat the frequency or severity of the migraine.

The ophthalmic migraine of which I should like to speak is only one manifestation of several ways in which migraine may affect the eyes, since transient pareses of extra-ocular muscles and even retinal hemorrhages and vascular changes have been ascribed to migraine, but it is certainly the most common eye manifestation of migraine, and is seen at some time or other by a very considerable proportion of all migraineous individuals. It has often been identified by the term scintillating scotoma, but this means little to the patient, and I am afraid that many physicians have not a clear picture in their minds of what it does look like. In the most typical and clear-cut cases the patient sees, and will attempt with more or less success to describe, an arc-like figure in one-half of the visual field, composed of brilliant lines in a more or less complex pattern, which sparkle, shimmer, or coruscate, and is usually seen against the background of a scotoma—a blind area in the field of vision which appears black or brown. This may of course be seen equally well in daylight or dark, with the eyes open or shut. There is considerable variation in the detail of pattern seen, but a strong general resemblance exists among them all. When studied more closely, as it has been by numerous individuals in various fields of medicine who have themselves suffered this form of migraine, the phenomenon will be found to start usually with a mottled, blotchy, or confused appearance of the object under observation. The blotchy area soon becomes a scotoma of appreciable size, always located in one of the lateral fields of vision. As it grows a bit the peripheral edge begins to show the brilliant pattern that is so characteristic. The area involved increases gradually for a period of 10 to 30 minutes and then fades and vanishes. The details of the pattern do not increase in size, but the pattern becomes more complex through the addition of new elements to it. As the pattern proliferates the inner side fades out into the scotomatous area. Occasionally the negative, or inhibitory, or scotomatous phase is lacking, and objects may be seen in the field immediately behind, or even between the so-called fortification figures. Since the disturbance arises near the point of fixation it is obviously an affection of the posterior pole of the striate visual cortex in the occipital lobe. The excitation spreads in a wave-like fashion forward through the visual cortex and therefore toward the periphery of the visual field. The rate of propagation and the measurements of the visual cortex (approximately 67 mm. from back to front) would indicate that this wave of excitation travels just under 3 mm. per minute in the average case. The rate of flicker of the figures seen is in the neighborhood of 10 per second. It may be related to the alpha rhythm. Patients may describe it as merely a flicker, or as spokes of brilliantly polished steel, or as resembling a picket fence made of diamonds. A physician has described it to me as looking like the heat waves rising from a hot iron. Some persons see it in black and white but more commonly it is in iridescent or opalescent colors.

The subject is important to me because I see so many patients who have suffered it for years, either with or without other manifestations of migraine, and have never been given a satisfactory explanation of why their eyes play this odd trick on them. Those who have seen it but recently often come in great apprehension—fearing some grave eye condition, or perhaps brain tumor. The homonymous hemianopic field defect which is part of the manifestation certainly does nothing to quiet these apprehensions. Many patients have sought relief from various sources, and may have with them a number of pairs of glasses. Too obviously the ophthalmologists who have seen them thought their symptoms were those of eye-strain, or perhaps merely neurotic. We have here another example of the importance of

taking a careful history, and listening with attention to the patient's description. I have found it worth while to keep at hand several of the various pictures that have been published of this, as many patients will at once recognize from a picture something I might have difficulty conveying to them in words.

I have said that I do not feel well-grounded in the therapy of migraine, and this applies to ophthalmic migraine equally. If a patient is sufficiently distressed I can give him the proper diagnosis, reassurance that no grave eye condition impends and that he will not be blinded, and refer him to someone who has more knowledge and the patience to deal with the problem in a general sense. But it frequently happens that after diagnosis and explanation the psychic element is mitigated to such an extent that the patient is no longer distressed and may even have less frequent and severe attacks.

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Discussion

DR. CHARLES E. STANFORD: Dr. Hoffman has given us a very clear picture of the ophthalmic phase of migraine headaches. I think possibly he is a little hard on the rest of us when he states that it is so seldom recognized. Dr. Hoffman mentioned the transient losses of vision, chiefly of the hemianopic type, that sometimes accompany or precede the migrainous headache and frighten patients a good deal. In the past seven or eight years I have seen a lot of these symptom complexes among university students. The student usually reports to the Health Service dispensary with the complaint of partial loss of visual field and he or she is then referred for examination as an emergency. By the time the student is examined, the symptoms have usually disappeared and the findings are entirely within normal limits. These hemianopic field defects seem to occur more commonly during periods of stress and among the student population are therefore much more common during the days and nights preceding quarterly examinations.

Recently I saw a young man who varied from the others in that his visual defect was not one of hemianopia, but a loss of central vision. He had a history of these attacks going back over a number of years. They occurred at times of stress and recently the boy was quite concerned about his coming induction into service, which seemed to make the attacks much more frequent. This type of transient loss of vision brings up the point of differential diagnosis. A few years ago I saw a man in his early thirties who had just such symptoms. The man also had a ten year history of very severe attacks of headache of sudden onset, uncertain duration, cessation without any known cause. He did not respond to any drugs. He had a number of eye examinations and had had glasses prescribed for hyperopia. These he wore for reading with some benefit from eyestrain, but no relief as far as the headaches were concerned. He had had considerable sinus surgery. Then in more recent months the transient attacks of visual loss occurred. He could very easily have been labeled a typical migraine. However, he was found to have a bilateral papilloedema and eventually was operated upon successfully for the removal of a brain tumor. I do not think that any case of apparent migraine should be labeled as such until all organic conditions have been thoroughly ruled out. Many of these cases of ophthalmic migraine do wear glasses unnecessarily. There are, however, a number of them who wear corrections for various reasons just as the rest of us wear glasses—either to see better or to see more comfortably. Occasionally these people find that their migrainous attacks are less frequent when glasses are worn.

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DR. CYRUS O. HANSEN: I'd just like to mention here the difficulty in obtaining information about migraine. When I first began to get these cases, back in 1925, no one could tell me what they were, and no one seemed to know much about what was going on. At that time I went to three of our very good

eye men, including the professor of ophthalmology in 1927, and I wasn't told then what they were or what their significance was. I finally read a book and there they were explained.

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DR. WALTER L. HOFFMAN: In flinging insults around about ophthalmologists, I should, of course, have said present company excepted. Not all ophthalmologists recognize migraine as well as Dr. Stanford. That's why he is in this group. Of course, in spreading propaganda about this we are just trying to keep the cases off our necks by getting other people to recognize them before we have to look them over.

GLOMUS TUMOR

(Giomangioma, Angioneuromyoma, Glomal Tumor)

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The glomus tumor is a small, benign, discrete, sharply circumscribed lesion arising in the arteriovenous structures of the skin, particularly of the extremities. It commonly occurs beneath the nail in which case its presence may be determined by a bluish or purplish discoloration of the nail. The tumor is minute, measuring usually not more than a few millimeters in diameter, and its presence may be unsuspected where the typical bluish color is not present. The patient usually complains of attacks of severe lancinating, knifelike pain, always arising at a definite point in the skin and frequently radiating up the limb. At times the entire half of the body may be involved in the paroxysm of pain. The painful attacks are usually brought about by injury or by changes in temperature, especially exposure to cold. The symptoms are so intense and severe that the patient is frequently suspected of being either neurotic or a malingerer especially where the characteristic bluish spot of discolored is absent. The specific location of the tumor can be readily determined by the fact that touching the exact pinpoint area overlying the tumor causes the patient to experience the severe paroxysm of pain. Permanent relief is obtained by excising the tumor, removing a good portion of skin and subcutaneous tissue from around the central area wherever possible. The use of x-ray and radium is said to be of no value.

The glomus is a normal vascular structure of the skin and these collectively make up the network of blood vessels in the reticular layer of the dermis and in the subcutaneous tissue. The plexus constitutes the arteriovenous anastomosis of the circulatory system of the skin. Besides controlling peripheral circulation it serves a purpose in the mechanism of temperature regulation of the body and also in the control of blood pressure. Glomera are not present in the skin of the newborn child but develop in the first months of life. The absence of these structures accounts for the instability of normal temperature regulation in the newborn. The individual normal glomus is formed from a branch of a cutaneous artery running through the subcutaneous tissue toward the skin surface. The small arterial branch which is to become part of the arteriovenous anastomosis has a muscular coat and in the area surrounding the anastomosis are found numerous non-medullated nerve fibrils. The glomus tumor is genetically related to the structures which make up the normal glomus and consists of hyperplasia of the blood vessel, nerve and muscle elements. No cause is known for the occurrence of the glomus tumor but trauma supposedly plays an important part. The majority of the reported cases have occurred in the fingers or toes but the tumor may occur elsewhere in the body. The differential diagnosis should include consideration particularly of the angioma, neurofibroma and melanocytoma. These lesions are painful but are seldom as sensitive as the true glomus tumor.

The case which I should like to present is that of a 49-year-old woman. The condition affects the left fourth finger. The lesion has not been actually confirmed by biopsy but the history is typical and the finger nail has the characteristic bluish discoloration. The patient has been aware of the condition for fifteen years during which time she has suffered great agony from the lesion without the benefit of any great amount of sympathy from those she has consulted. She came to my attention because of the fact that the tumor involves the underlying phalanx, an uncommon event but known to occur in some cases.

The patient suspects that the trouble arose from an accident with her sewing machine in which the needle pierced the finger but did not break off. There was no resulting infection but some time later the finger became painful and has remained so since. She lives in constant fear of bumping the finger and has frequently awakened at night with excruciating pain radiating from the finger up the entire arm. Changes in temperature cause severe pain and touching certain types of cloth, particularly rayon, causes her to have this same reaction. There is a hypersensitive pinpoint area just proximal to the nail which when touched causes her to cry out but she invariably draws her hand away at the slightest approach of anything toward the finger. Owing to the fact that the bony phalanx is involved in the tumor it would not seem reasonable that she could secure relief without amputation of the end of the finger. This she has so far been reluctant to do. Deep x-ray treatment which has been given merely on a hope of palliation has seemed to impress the patient that the finger is less sensitive. She definitely feels that the discoloration of the nail has been reduced by the x-ray treatment.

Discussion

DR. O. J. CAMPBELL: Doctor, isn't the objection to the removal of the tumor a question of the cosmetological damage it would do to the nail?

DR. J. F. POHL: It seems to me that the defect of the terminal phalange must be assumed to be part of the glomus tumor. You would have to take the nail off and permanently sacrifice it. I think this might cure the pain. This is the ring finger and one couldn't very well remove the tumor without digging in deeply. She feels that x-ray has helped her. The tumor has faded somewhat. The patient is anxious not to sacrifice any part of the finger.

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DR. T. J. KINSELLA: Do you think that the condition of the terminal phalanx there is the result of a tumor or a result of the trauma?

DR. J. F. POHL: The needle did not break off when the injury occurred and there was never swelling or drainage. It was just a clean puncture wound. It has been reported there are cases of bone damage in glomus tumor but these are rare. I believe that the defect in the phalanx is all part of the same lesion.

DR. CYRUS O. HANSEN: I have been very much interested in this case. I have seen four cases. The first one was at the clinic in the University hospital. It was shown to everybody because it was said to be very typical. The patient had terrific pains from a very minor trauma, or cold, which set off these paroxysms. I didn't see another one until I went to the University of Rochester. There I saw one on a toe. They have all been very characteristic. As everyone knows, they are terribly painful.

This is the first one I have treated with x-ray. As Dr. Pohl said, the books advise that x-ray and radium have no value in controlling them. Usually they involve a nail. Certainly no matter how the tumor was removed, there would be some deformity of the nail, but most persons would go through a great deal, even to losing the end of the finger, to get rid of the pain. This woman is unwilling to sacrifice the finger. I feel that she does seem to have definitely less trouble than she had when we first saw her.

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DR. WALTER L. HOFFMAN: As I remarked to Dr. Pohl before, one of my patients appeared with one of these tumors in the cornea. This tumor seemed to be on the cornea at the limbus. It was sensitive to changes in temperature, and you could see with a slit-lamp that it contained more nervous tissue than blood vessels. On section it was called a glomus tumor.

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DR. HARRY B. HALL: I have seen one case which has been explored and it has been identified by pathological examination, but it was not removed entirely and the patient has had further trouble. The lesion is on the sole of the foot. When I asked what was the matter, she just said she couldn't walk on her foot. She had this typical bluish angioma, and when I tried to touch the foot she drew it away. She was told she would have to have it excised. I didn't recognize immediately what it was but I thought it might be a glomus tumor, and I was able to

get a pathological report that it was. She is hobbling to school on crutches now, marking time until spring vacation.

She was operated and she was helped for about four years, but she said that certain things—as Dr. Pohl brought out—seemed to give her trouble. She never could go out where it was cold, and she had to be very careful. Apparently the heavy pressure doesn't bother her.

* * * * *

DR. HARRY A. CUMMING: As a dermatologist, I will have to confess my ignorance in regard to these lesions. I have never seen a case and previous to this presentation by Doctor Pohl, wouldn't have recognized the disease. Since the therapy for the removal of these tumors is always surgical, we have never considered them very seriously as part of our practice.

MARCH, 1945

THE MANAGEMENT OF ACNE VULGARIS

HARRY A. CUMMING, M.D.
Minneapolis, Minn.

Acne vulgaris is among the oldest of known skin diseases. Since its earliest description much work has been done in an attempt to find out more about its causative factors. As a result much has been learned, but like many other medical problems, there yet remains much more to be discovered. This disease, which comprises 10 per cent of all cases seen in dermatologic practice, and 50 per cent of all students entering college as brought out by Lynch at the University of Minnesota Student Health Service, is seen frequently enough by all physicians to be of some general interest. All too often, it is passed off lightly by disinterested individuals, and as a result many of these patients seek the advice of charlatans of one sort or another. Then, because of continued lack of improvement they give up hope, and resign themselves to silent suffering. We are frequently impressed with the fact that even the average physician is quite indifferent to the acne patient while the latter is always disturbed over his disease and seeks to find out what can be done about it. The patient's first interest is always in the cosmetic aspect, but one must not lose sight of the social and economic side of its complications. Not infrequently, as brought out by Marshall, they involve the victim's future to such an extent that he is unable to follow successfully his endeavors which in many cases may be tragic.

It is not my intention to review and discuss this broad subject in detail, but merely to mention some of the more important concepts concerning its etiology, pathogenesis and morphology, and then outline in detail what we consider a practical and successful regime of therapy.

ETOLOGY

Much speculation has been given to the etiology of this disease. The bacteriologic theory was very prominent for a long while, but subsequent work showed it not to be the answer and now vaccines are used only as an adjunct to other methods of treatment. For a time much stress was placed on general factors. Included here were such things as poor hygiene of the skin, occupational and home living conditions, and poor physical states, indicating abnormal function such as constipation and other gastro-intestinal abnormalities. More recently Bloch, Marshall and others have discussed the influence of heredity and endocrine dysfunction. Hamilton has attempted to show the causative effect of the male sex hormone, while others have demonstrated the various influences of metabolic abnormalities. Nothing definite has developed from chemical studies of the blood sugar, glucose tolerance, and cholesterol metabolism. All in all we feel that the seborrheic tendencies seen in these cases are influenced by hereditary factors, and that the patient's physical and functional disturbances resemble those of their forebears much as do their physical and anatomic characteristics. Therefore it is the consensus of opinion at present that acne vulgaris is not a disease *sui generis*, but rather a syndrome which is the result of a combination of influences. Supporting this view are its time of onset which seems to relate it to the activity of the glands of internal secretion, the effects of ingesting certain foods, the premenstrual flare, and the hereditary predisposition for the disease.

PATHOGENESIS

The primary lesion and first clinical manifestation is the comedo. It is probably due to the effects of the various mentioned factors on the follicle. First there is a blocking of the follicle mouth. Then progressive events of dilatation, irritation, and secondary infection lead to a fully developed case with associated comedones, papules, pustules, crusts, and pitted scars. These characteristics are variable because of the many stages through which a case may go, but the pathologic picture is exactly what one would expect as a reaction to foreign bodies such as comedones and secondary bacterial invasion. One point should be stressed, and that is the frequent presence of many giant cells in areas of intense inflammation with necrosis, because these might be interpreted by some as indicating tuberculosis. These are the areas which frequently result in pitted scars.

THERAPY

It is fully realized that a large percentage of acne cases are self-limited, and that the disease disappears spontaneously after the twenty-fifth year. In spite of this, because of the unhappiness and emotional strain which it causes the teen age sufferer and because of the social and economic limitations which it places on the older patient, everyone with acne should receive the utmost in therapeutic approach and sympathetic encouragement.

The treatment of this disease has passed through many phases and has included both internal and external remedies. Some are still used but many have been discarded. Since it is viewed as a manifestation of a deranged sebaceous gland system, we adhere to the group who feel that it is of benefit to eliminate such foods as fats, including milk, starches, gravies, sea foods, nuts, and iodized salt. Therefore, each patient is given a diet list and simple printed instructions for the local care of the skin. Stress is laid on regular habits of living, and especially on getting sufficient rest and relaxation. Constipation, if it exists, is eliminated as are any foci of infection. Because of associated seborrhea, frequent soap and water cleansing of the scalp is generally demanded and well tolerated. For this a liquid shampoo is advised and if the condition is severe a stimulating sulfur ointment is used for twenty-four hours before shampooing.

A minimal dose of stock staphylococcus vaccine is given at each visit, not for its specific value, but only as a form of mild foreign protein therapy to enhance body resistance.

In recent years, roentgen ray has been our chief weapon in the specific attack on the disease. With it we attempt to achieve a relatively rapid and permanent cure and to a large degree avoid the frequent use of unsightly local applications. Then too, delaying this form of treatment in such deep types as acne indurata, may result in further scarring which may often be disfiguring. Even in the absence of scarring it is not well to allow the disease to continue unchecked because the skin is likely to become coarse and oily.

Roentgen ray treatment of skin disease was first popularized through the efforts of Pusey, and later through valuable contributions by McKee and others. As a result, much experience has shown that when it is used properly, it is our most effective therapeutic agent. However, there are, even today, physicians who condemn the x-ray treatment of acne vulgaris, although a far greater proportion feel that it is a safe and a reasonably certain method. When used in conjunction with indicated constitutional and local therapy it is the desirable method and properly applied the cure is much faster, cosmetic results are better and recurrences are less frequent than by any other. No danger of injury exists if a careful examination of the skin is made before each treatment, and if proper dosage is given weekly with a standardized machine. In a large percentage of cases, when carefully used, x-ray therapy spells the difference between success and failure.

A complete understanding between doctor and patient at the outset is highly desirable. Both the drawbacks and expected results should be discussed in such a way as to eliminate any later unpleasant complication with a dissatisfied patient.

The benefits from x-ray are probably due to their inhibitory effects on an overactive sebaceous gland system, and disintegration of inflammatory changes. This prevents the formation of

comedones. Concurrent use of local applications is generally not indicated, but in an occasional case where the skin is extremely oily, a drying preparation may be advantageous until the x-ray effect sets in. Unless the skin becomes excessively dry and uncomfortable, the use of greases and creams is forbidden.

The larger comedones are expressed at each visit and the pustules and cysts drained. Patients are instructed to refrain from attempting this themselves for invariably they damage surrounding tissue, causing increased inflammation.

In those cases where acute inflammation predominates, it is necessary to delay the use of roentgen rays for a few weeks while soothing local remedies are used. Then as acuity subsides, x-ray therapy is used in the usual manner and average satisfactory results are obtained.

Our exact technic consists in giving 75 roentgen units unfiltered to the affected areas. This dose is given once a week for three weeks, and skipping every fourth week until a course of twelve treatments is given. Thus, due to the two week interval following each three x-ray treatments, the entire course requires sixteen weeks. We feel that any danger of erythema or other type of roentgen reaction is greatly reduced by skipping every fourth week. In addition by carrying our course of therapy to a full conclusion of twelve roentgen treatments, recurrences are less frequent. It must be remembered that the roentgen effect is gradually accumulative and also that very small doses are used here; therefore, very little if any benefit will be noted before the sixth or eighth week. If this is explained to the patient early he will be much less impatient and more easily handled during the first half of the course.

To use roentgen rays satisfactorily one must not only know *how*, but also *when* to use them. Knowledge of when to discontinue treatment is an invaluable aid in properly treating those who clear up quickly. Rapid response often makes fewer treatments desirable. Some cases might require irradiation to the point of injury in order to accomplish a cure so complete as to prevent even the slightest recurrent lesion. Such extension treatment is unnecessary and inadvisable. Obviously, in careless hands x-ray does not constitute a perfectly safe method of treatment, but I fully agree with Pels in that it may be used advantageously in all chronic types if proper dosage is given.

In a consecutive series of 134 cases of acne treated by this method in the outpatient clinic of the Minneapolis General hospital, 71.6 per cent resulted favorably, 10.5 per cent showed marked improvement, and 18 per cent showed partial recurrence in from six to twelve months following completion of treatment. Of the 71.6 per cent who showed favorable results (61 cases), 63.5 per cent were clear with no recurrence a year following completion of treatment. Here the result was considered excellent. Of this same group, 36.4 per cent (35 cases) showed an occasional recurrent lesion and the result was looked upon as very successful. Fourteen cases—the 10.5 per cent which showed much improvement but suffered from some recurrent—felt that the treatment had been of enough benefit to make it well worth while.

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Discussion

DR. S. E. SWEITZER: Dr. Cumming has outlined the chief points. I want to emphasize the indifference I find among the general practitioners to the treatment of acne. These patients who have acne feel very keenly about their condition. They feel self-conscious in the company of their younger friends, and develop neuroses, and some become what we call "pickers." They start picking at themselves with the result that they leave bad scars impossible to eradicate.

Now, as far as the etiology goes, I think we can be frank to say we don't know what the cause is. We have comedones in infants. We don't know why. We feel it has something to do with sex glands in puberty but some get it years after puberty starts and some even in their late twenties and thirties. Some have a lot of comedones and some have deep-seated papules or pustules.

From the incidence in Minnesota, when you consider that a cross section of the better families of the state are represented by the children going to the University of Minnesota, examinations for enrollment, in the student health service, show more than half of the entering students—truly a cross section of the finest families—have more or less acne. I often wonder what makes that, and I have figured it out to some degree. This is a dairy state. A lot of people think that if you take a child off milk his teeth are going to fall out. After sixteen years of age the teeth are all formed and it doesn't make the least difference whether you have milk or not. Over half the dentists in this town may not agree to this.

One of the chief causes of acne, I think, is milk. I can watch a patient walk in and can tell if he is a milk drinker or not. With all the pressure of business that the kids have now, they might as well throw their teeth away. All they eat is hamburgers, milk and Coca-Cola, three times a day. They throw the vegetables out and give the lettuce to the rabbits. They don't know a thing about eating. I think one thing that has a great deal to do with this high incidence of acne is the fact that these kids are brought up with the idea of drinking so much milk. I have quart-a-day and two-quarts-a-day patients. It is foolish to take all this milk.

So far as the x-ray therapy goes, we have here, and also all over the United States, the hit and miss variety of treatment for acne. You give them x-ray and then if your girl is too tired to give x-ray the next time you give them a lamp treatment. You give x-ray with the idea of diminishing the activity of these sebaceous glands, up to the point where the hyperaction

stops. In my private practice I have 75 per cent cures. We are lucky to get 70 per cent on the clinic patients as they have less opportunity to stay on rigid diets than those who pay for treatment. As to the effect of vaccine, we give very small doses of vaccine, but it isn't absolutely essential in treatment of acne. As for the diet, besides the elimination of excessive fats is the elimination of too much sweets.

* * * * *

DR. HARRY A. CUMMING: This method of treating acne is one that I learned while training at the General hospital under Doctor Sweitzer and I appreciate his coming over to discuss this paper.

We feel that our results in the treatment of acne in the clinic patients are pretty good, but I fully agree that they are somewhat better in private practice where we are dealing with a more cooperative group of patients.

There still remains, as Doctor Davis brought up, the occasional case that is so mild that it does not need x-ray treatment. In these cases we modify the treatment. The choice of method depends upon the case itself and any combination of methods, of course, depends upon the judgment of the operator.

There is just one other point that I want to bring up and that is the desirability of the use of x-ray in severe acne. It has been suggested that the treatment of acne vulgaris be deferred until the age of eighteen years or later because of frequent recurrences if treated before this age. We have more or less ignored this in our approach to the subject and have found, to our satisfaction, that it is better to treat the cases, when they present themselves, to prevent scarring and damage to the skin.

RESECTION OF PANCREAS FOR HYPERINSULINISM DUE TO ISLET-CELL TUMORS

STANLEY R. MAXEINER, M.D.

Minneapolis, Minnesota

K. M., aged 24, a discharged soldier wounded twice in the South Pacific, experienced his first symptoms when he became unconscious on sentry duty. He was evacuated and experienced several more unconscious attacks during the process of evacuation. He was discharged from the army as an epileptic for want of a better diagnosis.

The patient's symptoms were lethargy, drowsiness and irritability and he was uncooperative and difficult to manage. During stupor the blood sugar was found to be as low as 28 mg. per cent. He promptly regained consciousness after the intravenous injection of glucose. Repeated blood studies showed a persistent hypoglycemia. The preoperative diagnosis was hyperinsulinism due to islet tumors.

The patient was operated upon and 75 per cent of the pancreas was removed. The specimen weighed 46 grams and contained eight islet tumors. Microscopic study revealed characteristic islet tumor tissue.

Since the operation the blood sugar is stabilized near 100 mg. per cent. He has had no more attacks, has gained weight and strength and has a completely changed personality.

(Lantern slides of gross specimen and microscopic tissue were shown.)

NATIONAL HEALTH PROGRAM

The congressional subcommittee's analysis of national health problems and its recommendations concerning certain aspects of a national health program are described in Interim Report No. 3. The objective of the subcommittee is to make certain that adequate medical care and preventive services are placed within the reach of all of the people in all of the communities in this country. It is proposed in Interim Report No. 3 that the Federal Government shall give financial assistance to the States, in accordance with their needs and resources, for the development of State plans which will enable every community to obtain facilities suited to its needs. *A coordinated network of hospitals and health centers is proposed. The full cooperation of both private and public agencies is contemplated.* The need to evolve prepayment plans which will remove economic barriers to medical care and at the same time assure adequate compensation and professional freedom for the practitioner is recognized.

American Student Health Association News-Letter and Digest of Medical News

SCHOOLS IN NEED OF STUDENT HEALTH PHYSICIANS

In need of Directors:

Iowa State Teachers College, Cedar Falls, Iowa.
 Montana State College, Bozeman, Montana.
 University of New Hampshire, Durham, N. H.
 University of Wyoming, Laramie, Wyoming.

In need of Assistant Physicians:

Yale University, New Haven, Connecticut.
 The University of Wisconsin, Madison, Wisconsin. (Two possible openings—more or less temporary.)

University of Illinois, Urbana, Illinois.
 University of Michigan, Ann Arbor, Michigan. (May need assistant in near future.)
 The State University of Iowa, Iowa City, Iowa.
 University of Colorado, Boulder, Colorado.
 Iowa State Agriculture College, Ames, Iowa.

The following positions also now open for physicians in college health services:

Syracuse University, Syracuse, New York (wants a psychiatrist).
 Georgia State College for Women, Milledgeville, Georgia (wants woman physician).

NEW DIRECTORS

The following new directors of student health services have been appointed: Dr. Leonard Folkers, goes to Stephens College, Columbia, Missouri, to replace Dr. Florence Mahoney who has taken a Baruch fellowship in physical medicine at University of Wisconsin. — Dr. Max Durfee, formerly Iowa State teachers college, goes to University of Oklahoma, Norman, Oklahoma, to replace Dr. F. T. Gastineau, resigned.

Dr. Ruth Boynton represented the American Student Health association at a meeting in New York City, May 20, to correlate activities of the various groups teaching health education.

Dr. B. D. Roberts represented our association at the inauguration of Dr. Harold Walter Stokes as the new president of New Hampshire university on December 17, 1944.

New student health service buildings are being planned for the University of Alabama, University of Colorado, Connecticut college, University of Delaware, and the University of British Columbia.

Dr. Wm. H. Turner, Jr., has been appointed physician in the Oberlin college student health service, replacing Dr. Thompson, resigned.

The Tuberculosis committee of the American Student Health association revised and enlarged their booklet on "Social and Economic Aspects of Tuberculosis."

The original edition, published by the National Tuberculosis Association, sold 7,000 copies. Samples of the booklet were sent to all departments of sociology in our colleges and universities.

OLIVER E. BYRD, Ed.D.

Associate Professor of Hygiene
 Leland Stanford University

VETERAN PLACEMENT BY NORTHROP AIRCRAFT

Harold B. Dye, M.D., chief surgeon for the Northrop Aircraft, Inc., of California, reports that a placement program, by which veterans of this war, particularly those with physical handicaps, may be intelligently moved into industry, has been developed at Northrop Aircraft, Inc., producers of the Black Widow P-61 night fighter. So favorably has this program been received that it promises to serve as a model in many other industries throughout the country.

The Northrop placement program begins at Birmingham General hospital at Van Nuys, California, where the company has established an airplane production department, known as Department No. 99. It contains machines, tools and all equipment necessary for light metal shop work.

Convalescents, nearly all of whom are overseas casualties, are given a short training course and then start on actual production of Black Widow parts, for which they are paid standard shop rates. When these men are discharged for return to civilian life, they are encouraged to take employment at the main Northrop plant.

At the time of his pre-employment interview and physical examination the veteran is assigned to a job in keeping with his physical capacity and past experiences. At this time his personnel folder is marked and a work-limitation form completed which instructs the department supervisor not to transfer him to other work without the approval of the veteran coordinator, the safety engineer and the medical department. This assures the veteran of being placed on work he can do and of being kept on that job until his physical condition is such that he can be safely moved to some other type of work. This appears to be a satisfactory program for the physically handicapped.

The more difficult problem is the placement of those veterans who have been discharged because of a mental disorder, usually a war neurosis.

In the case of veterans discharged because of a mental disorder, their placement in industrial plants immediately after discharge from a hospital does not give them sufficient time to make the necessary adjustments.

These men should be under the supervision of a psychiatrist in order that their emotional lapses can be studied and treated. The majority of them will soon fall into a regular routine and recover from their mental

disability if they are not placed where the emotional strain is too great.

The Northrop company has established a training program which is a big step in the right direction. Convalescent patients, at regular wages, are trained in aircraft production work. Upon recovery the veteran who is discharged is adjusted to a special type of work and readily fits into this work. This is primarily for the physically handicapped or injured. The same basic plan could be worked out for the mentally handicapped.

Reference. Dye, Harold B.: "Veteran placement, Industrial Medicine 13:989-90 (No. 12), December 1944.

VACCINATION AGAINST TUBERCULOSIS

Wells, Flahiff, and Smith report a ten-year study of the vaccination of patients in a mental hospital at Kingston, Jamaica, with heat-killed tuberculosis germs.

Of the patients who were not infected with tuberculosis on admission to the hospital 325 were vaccinated with heat-killed tubercle bacilli. Among these persons 45 developed tuberculosis. In a corresponding control group of 312 persons who were not vaccinated against tuberculosis there were 68 cases of the disease.

Evidence showed, however, that the protection which may result from the injection of dead tuberculosis germs is not effective immediately and is not an absolute protection, especially if the person is exposed to repeated massive infections.

Statistically there appears to be some value in the method. During the entire ten years 13.8 per cent of the vaccinated group developed tuberculosis, compared with 21.8 per cent of the unvaccinated control group.

The study suggests rather than proves that there may be a practical use for heat-killed tubercle bacillus vaccine in certain groups of individuals who may be exposed to unusual risk of tuberculosis infection. The authors suggest that such groups might include medical students, pupil nurses, hospital attendants, household contacts and possibly others.

Reference. Wells, C. W.; Flahiff, E. W., and Smith, H. H.: "Results obtained in man with the use of a vaccine of heat-killed tubercle bacilli." American Journal of Hygiene 40:116-26 (No. 2), September 1944.

CHANCES OF SPREADING SCARLET FEVER IN THE FAMILY

H. O. Swartout, M.D., and W. P. Frank, M.D., report on a study of 250 cases of scarlet fever that occurred in the Alhambra, California, district from 1939 to 1943.

Of the 250 cases, 231 were treated at home. In this group there were 383 persons between the ages of six months to 19 years who were exposed to the infection. Out of this group 60 developed scarlet fever within forty-eight hours or longer after the original case.

Of the 250 cases, 19 were treated at the contagious

disease hospital or at home with the other children removed. In this group there were 60 children who might have gotten the disease, but no cases of scarlet fever occurred among them.

Of the 550 adults in the family who were exposed to scarlet fever only 6 developed the infection from the original case.

From this survey it becomes apparent that 1 out of every 6 or 7 children in the family who are susceptible to scarlet fever will get the disease from the sick member of the family during the quarantine period. Only a small number of adults will develop the disease, namely between 1 and 2 per cent.

Reference. Swartout, H. O., and Frank, W. P.: "Contagiousness of scarlet fever," California and Western Medicine 61:72 (No. 2), August 1944.

MAYO MEMORIAL COMMITTEE

The Mayo Memorial Committee of Founders sponsored a dinner in Minneapolis on June 5 on which occasion the two principal guests were Vice Admiral Ross T. McIntire, surgeon general of the navy and Dr. Jas. L. Morrill, then president of the University of Wyoming, since made president of the University of Minnesota. Both guest speakers visualized unlimited possibilities for advancement of medical research, greatly affecting the nation as a whole. Both emphasized the great need for a center for medical research, teaching and administration, the \$2,000,000 twelve-story building to be erected at University of Minnesota to perpetuate the memory of Dr. William and Dr. Charles Mayo. Admiral McIntire in tracing the medical advances made by the navy during the war said, "We have no right to make the mistakes we have made in the past so far as medical research is concerned. And you who are instrumental in setting up this great research center will help to remedy in the future those frightful conditions such as we found American youth to be in at the start of the war." Praising the medical achievements of the Doctors Mayo, both speakers congratulated the people of the nation for their foresight in selecting and making possible such a memorial.

"The need for co-operation, for partnership, must have been in the minds of the Mayo brothers when they established the Mayo Foundation, and the University will try to be worthy of this later testimony to their faith," Dr. Morrill said. Formation of a national committee for the memorial, to be headed by John S. Pillsbury, Minneapolis, was announced by Dr. Donald J. Cowling, retiring president of Carleton college and chairman of the Committee of Founders. Dr. Cowling also suggested that Commander Harold E. Stassen be asked to become chairman of an international committee now being formed. Over \$500,000 in contributions toward the research center have been received, Dr. Cowling said. The Minnesota state legislature has appropriated \$750,000 and it is planned to ask for \$250,000 more at the next legislative session. The additional half million dollars is being sought in private gifts.

MEET OUR CONTRIBUTORS . . .

Among the varied and human pleasures of medical publishing not the least is the one that concerns our contributors.—their educational backgrounds, their personalities as revealed by their writings. That our readers may share this pleasure with us is the reason for these brief notes.

Dr. Paul Henry Holinger specializes in broncho-esophageal and laryngeal surgery and practices in Chicago. After graduating from Northwestern university, he went to Philadelphia to Temple university where he worked in Chevalier Jackson's bronchoscopic clinics. He has served as secretary of the American Broncho-Esophagological association and secretary-treasurer of the American College of Chest Physicians. He is a member, too, of the American Laryngological, Rhinological and Otolaryngological and of the American Laryngological associations.

Dr. Gordon Richard Kamman of St. Paul, Minnesota, received his academic and medical training at the university of Minnesota after which he studied his specialty, neuropsychiatry, at the Queen's Square hospital in London, the university of Zurich in Switzerland and at Harvard. He is chairman of the advisory committee to Minnesota's bureau of the feeble-minded and epileptic, past president of the Minnesota Society of Neurology and Psychiatry, a member of the American College of Physicians, and national and state psychiatric associations.

Dr. Chester W. Lawson is practicing in Havre, Montana, after his return about a year ago from Canton, China where he and his family were interned at the outbreak of the war. He received his medical degree from Johns Hopkins medical school, and went to China as medical missionary when he had completed his course at the Boston Lying-in hospital.

Dr. Orville Morris Moore (Helena, Montana) received his M.D. at the Nebraska University medical school in 1938. His graduate work consisted of an internship and resident pediatrician at Vancouver general hospital, Vancouver, B.C., and a pediatric fellowship at Minneapolis General hospital. He is a member of Lewis & Clark county medical association and has practiced in Helena for three and a half years.

Dr. Frederick William Hoffbauer (St. Paul), university of Minnesota B.S. 1934, M.S. 1935, and M.D. 1938, did graduate work at the same institution in the departments of physiology and medicine. He has practiced here for nine years, specializing as an internist. Dr. Hoffbauer holds memberships in Minnesota society of internal medicine, Minnesota pathological society, American diabetic association and the Central society and American federation for clinical research and received the Hormel Research Foundation award 1944 to 1945.

Dr. Erling W. Hansen, Minneapolis, clinical professor and director of the division of ophthalmology at the university of Minnesota, received his degree from that university, did graduate work there and in New York and Vienna preparing himself for his specialty, ophthalmology. During World War I he served as medical officer with the First division and was decorated with the French croix de guerre and the United States silver star. His society memberships are too numerous to enumerate here and they include the American College of Surgeons and both national and local ophthalmological and otolaryngological societies in several of which he has held important offices. He is the present president of the Minneapolis Academy of Medicine.

Dr. Fred W. Wittich, Minneapolis, was graduated from Johns Hopkins medical school in 1913, had postgraduate training at Johns Hopkins, the Trudeau Sanitarium and the university of Minnesota, and now specializes in internal medicine and allergy. He has served the university of Minnesota as assistant professor of medicine and assistant chief of the medical clinic. He is a fellow of the American College of Chest Physicians, of the American College of Allergists and of the American Academy of Allergy; a member of various other national and local societies and of the honorary Sigma Xi. He is also an honorary member of the Argentine Allergy society. He is now secretary of the editorial board of the Annals of Allergy.

Dr. Carl Warren Laymon, Minneapolis, specializes in dermatology. After receiving his medical degree at the university of Minnesota he spent three years in graduate work there and won his doctorate. He is a member of the American Dermatological association, and of the Minnesota and Chicago Dermatological societies. He holds membership also in Alpha Omega Alpha and Sigma Xi.

Dr. Walter Lees Hoffman, Minneapolis, is assistant professor of ophthalmology at the University of Minnesota from which he received his medical degree in 1936. In preparation for his specialty, he spent three years as a fellow in ophthalmology there. Besides his membership in national and local medical societies, he is a member of the American Academy of Ophthalmology and of the Minnesota Academy of Ophthalmology and of Otolaryngology.

Dr. Harry A. Cumming, Minneapolis, spent three years as fellow in dermatology and syphilis at the university of Minnesota, after graduating from that university's medical school. He is secretary of the Minnesota Dermatological society, a member of the American Academy of Dermatology and of the national and state medical societies.

Dr. Stanley R. Maxeiner, graduate of the University of Minnesota, worked for ten years as the assistant to Dr. Robert E. Farr, during which time he studied at numerous clinics in England, France, Belgium and the United States to perfect himself in his specialty, general surgery. He is a Clinical Assistant Professor of the Department of Surgery, University of Minnesota and a consultant in Surgery, for United States Veterans Administration; a fellow of the American College of Surgeons and, also, a member of numerous local and national surgical societies.

Book Reviews

Malaria in the Upper Mississippi Valley, 1760-1900, by ERWIN H. ACKERKNECHT. Baltimore, Md.: Johns Hopkins Press, 142 pages, 1945, \$2.00.

This timely monograph (a supplement to the *Bulletin of the History of Medicine*), should be of special interest to residents of this section of the country, not only because it brings to light many unfamiliar facts of our malarial history, but also in that it warns of the possible resurgence of this disease with the return from the Pacific of our soldiers.

The states included in the study are Illinois, Missouri, Iowa, Wisconsin and Minnesota. The author admits the difficulties of a verified basis for his conclusions concerning the earlier days, due to the lack of statistics, the scarcity of medical men and the confusion of diagnoses, but he feels that the evidence of explorers and the marked similarity of experience in all the states studied justify these conclusions. These are briefly: there was little malaria in the period of exploration; following the pioneer invasion malaria reached epidemic proportions that varied merely in degree (lowest, but still high in Minnesota); after repeated fluctuations the disease retreated rapidly with the settling and growing prosperity of these states, to become almost non-existent except in a few isolated regions.

A careful analysis is given of the causes for this decline as suggested by health officers and other epidemiologists; there is an interesting chapter on the history of the use of cinchona bark and quinine which, the author thinks, have played but a minor part; comparison of malarial conditions in other sections of the country is made. The author concludes that not one but many factors contributed to the disappearance of the disease in these five states. An interesting point is his finding that the increase in dairy cattle played a major part in Iowa, Wisconsin and Minnesota. In all five the arrest of population movements, the installation of railroads, the increase in wealth and climate seem to have been primary factors in the decline.

In spite of 30 years of intensive anti-malarial activity there are still in the United States an average of 4,000,000 cases a (Continued on page 261)

The JOURNAL LANCET

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MINNEAPOLIS, MINNESOTA, JULY, 1945

ANXIETY NEUROSIS

We feel it safe to assert that no pandemic in the history of man has ever attained a numerical magnitude and geographical distribution commensurate with the anxiety neurosis that has afflicted the inhabitants of this globe during the past few years.

We do not refer only to those extreme cases that develop on the battle field; naturally the nearer to the actual fighting the greater are the casualties. These are the immediate problems of members of the medical corps who have not only done a fine job in eliminating, so far as possible, psychoneurotic personalities long before they reached the battle front, but equally have they recognized the urgency of prompt, on-the-spot treatment of mental crack-up cases. We are thinking about the entire population. Those not serving with the armed forces are

nevertheless exposed to incidental disturbances. There is an emotional upset at family partings. There is an uncertainty as to the whereabouts and welfare of loved ones. There is a lurking fear in the anticipation of a personal loss, and grief on its confirmation. There is stress of work and nervous strain in doing and giving to the utmost. There is a desire to keep posted hourly on the latest news, but commentators on air and paper differ in the interpretation of its significance and its effect on future events, and so the earnestly groping mind becomes confused by conflicting statements.

Sometimes organic disease may be simulated by a purely functional disturbance while in other cases one may be superimposed upon the other, calling for a dual perspective on the part of the diagnostician if he would properly evaluate the factors involved. A.E.H.

TAKING AN INVENTORY

There would seem to be no doubt that the demand for hospital care will be far greater after the war than ever before. Ten million men and women in the armed forces will return with a new realization of what medical and hospital service can mean to them personally. At home hospital insurance and higher economic levels have made it possible for thousands to learn at first-hand the advantages of hospital over home treatment for illnesses. The number of hospital beds added each year throughout the country has increased far faster than the population and is now ten times as great as it was in 1943. But the aim to provide adequate hospital care for every person needing it at a price commensurate with what he can pay is far from reached.

Before this goal can be even approached many weighty problems will have to be solved; problems of costs, of better management, of higher professional standards, of adequate medical talent, and perhaps most complex of all, the problem of the satisfactory distribution of hospitals and health centers that they may be accessible to those completely removed now from health facilities.

That there has been a general maldistribution of medical services throughout the country is generally accepted but something of its real significance is gained from the statement of Surgeon-General Parran that approximately 1,200 counties with a 1940 population in excess of 15,000,000 persons have no recognized hospital facilities whatever. This in addition to the hundreds of hospitals now operating under inadequate conditions by reason of war shortages or what not.

The solution of these problems will require the efforts and cooperation of some of the best minds in the country; of government officials, national and local, of professional men and women, of hospital executives, of business men, of labor, of women's organizations. But before the first steps can be taken we must have a complete picture of the medical resources and specific needs of every state in the country.

Fortunately such a picture is now in the making. Last fall, through the efforts of the American Hospital Association and financed by the Commonwealth Fund, the W. K. Kellogg Foundation and the National Foundation of Infantile Paralysis, a Commission on Hospital Care was established with headquarters in Chicago and given the job of making an inventory of the Nation's hospital facilities. Its members include doctors, dentists, nurses, hospital executives, public health workers, representatives of labor and industry, specialists in sociology and economics. Its objectives are "to take a census of the present hospital and public health facilities in the nation; appraise their capacity for service; establish standards for evaluating physical facilities, organization and management of hospitals; determine the overall national need for additional facilities and service; formulate a national coordinated hospital plan and to suggest methods by which that plan can be realized."

Already 35 states are at work on their surveys. Among these of our own northwest are Iowa, Minnesota and North Dakota. Montana is among those in which survey organizing committees have been established. The

Commission on Hospital Care will act as a coordinating body for the state committees and furnish a standard questionnaire as well as technical consultants.

The medical profession should be especially interested in promoting this work. It cannot fail ultimately to bring about a radical improvement in the general health of the state and it may very well help solve the problem of keeping its brilliant young medical graduates from seeking wider opportunities afar where they can find the laboratories and hospitals they need for their scientific work.

The address of the Commission is 22 East Division, Chicago 10. The Director of Study is Dr. A. C. Bachmeyer.

M. U.

BOOK REVIEWS (Continued from page 259)

year, with 5,000 deaths. History, moreover, teaches that epidemics of malaria have been known to have reappeared nearly a century after their disappearance. Dr. Ackerknecht warns us: "it may be well to remember that malaria in the Upper Mississippi Valley was not killed by a single magic bullet; the monster was only put in chains, the links of which we have tried to study. Each link of the chain is important, and the breaking of one link may set free again the evil fiend."

The Autobiography of Science, edited by FOREST RAY MOULTON and JUSTUS J. SCHIFFERES. Garden City, N. Y.: Doubleday, Doran & Co., 666 pages including a selected list of headings and index, 1945, \$4.00.

In this fine anthology the editors have chosen from their original outline of 300 names those of 100 scientists whose work they regard as marking "turning points" in the story of science from its first wistful gropings in antiquity down to the present, and have recorded passages from their writings describing "the best thing a man ever said or wrote about the most important thing he ever did or thought." Preceding the quotations from the scientists they have contributed biographical notes and commentaries, a preface and an introduction in which they tell of their aims in preparing their book, and with much charm, disarm criticism of the inevitable omissions. The chronological sequence by periods has been followed and although the reader will miss many names he would like to have had included, the net result will be that he will find himself participating excitedly as step by step the order-loving thinkers of the world lead mankind from superstition to truth.

Let no one think this is a dull book. On the contrary it is full of drama and entertainment. It is not a mere group of quoted sentences and paragraphs. Some of the passages are several pages long, and always enough is given to insure understanding of each man's specific contribution. Indeed to most readers the most surprising aspect of the book will be its readability. A truly great scientist is a man of vivid imagination, a creative artist burning with an almost fanatical zeal to solve a secret and he writes of his theories and discoveries almost always with unexpected clarity and often with a remarkable literary style whether he be an Osler or an Hippocrates.

Much credit is due the editors. The book has demanded not only careful research but a feeling for what they call "the culture of science." Moulton was for many years professor of astronomy at Chicago university and is widely known for his scientific publications; Schifferes, a former Minneapolis, edited *Modern Medicine* for eight years and has not only written many scientific articles but plays which have been produced in several cities. Richard Scammon of the University of Minnesota helped them greatly in their selections. This reviewer heartily concurs with their advice to their readers: "There are six ways to read this book: as a story-book, a history book, a textbook, a reference book, a source book, or a chronicle." We would add a seventh—as a bedside book. It won't make you sleepy but it will send you off with a comforting faith in man and his future.

News Items

Governing bodies of the North Dakota state medical association held a two-day meeting in Valley City May 20. The opening ceremonies included an address by the president, Dr. F. L. Wicks. Reports of the officers and of standing and special committees were made and referred to reference committees. Dr. James F. Hanna of Fargo was inducted as president for the coming year.

South Dakota state medical association's annual business meeting (of the council and house of delegates) was held June 9 and 10 at Watertown with Dr. D. S. Baughman presiding. Dr. William Duncan was elected president for the coming year.

The second annual meeting of the North Dakota public health association was held at the state university May 25 and 26. The guest speaker was Dr. Haven Emerson, president emeritus of public health practice, Columbia university, his subject, "Local Health Units, the Basis of National Health." The program included inspection tours of the blood plasma and public health laboratories. Dr. F. C. Lawler, professor of bacteriology and immunology of the university of North Dakota continues as president of the association.

Dr. R. G. Mayer, secretary of South Dakota state medical association, returned early in June from two week's stay in New York City, during which time he attended a course in recent advances in neurology at the New York Post-Graduate medical hospital.

Dr. E. S. Stenberg, Sioux Falls, South Dakota, is at the Mayo clinic, Rochester, Minnesota, as this issue is being made up.

The Minnesota state board of health has elected Dr. Ruth E. Boynton of Minneapolis to its presidency.

The D.P.'s (displaced persons) program of UNRRA has drawn Lieutenant Colonel Chas. E. Proshek of Minneapolis into its service as an area medical officer. Dr. Proshek has already been commissioned by the army and has left for Europe. This appointment is a direct result of outstanding service to the Red Cross in World War I.

The Montana members of the American College of Physicians held a meeting at Hamilton, May 5. Major Glenn Kohls, member of the United States army typhus commission gave an illustrated talk on scrub typhus.

The house of delegates of the Minnesota state medical association at its meeting held in St. Paul May 21, took action toward the establishment of a state-wide non-profit, prepaid medical service organization in accordance with an act passed by the 1945 legislature. Eighteen doctors, two from each of the nine districts in the state, were named and directed to name three others at large, to form a temporary board of directors to prepare articles of incorporation for the service. Dr. Burt Branton of Willmar is temporary chairman. At this its 92nd annual meeting the association elected Dr. Edward Simons, Swanville, president, to take office January 1st.

Dr. G. Wilson Hunter, F.A.C.S., Fargo, North Dakota, and member of the International College of Surgeons, has been named delegate to the International College convention to be held in Lima, Peru, in September. Dr. Hunter is head of the department of obstetrics and gynecology at the Fargo clinic.

Dr. Carl J. Baumgartner, Bismarck, North Dakota, was named the outstanding president of the state's Junior Chambers of Commerce during the past year and was awarded the Jaycee key.

Dr. Robert Kamish of LeSueur county recently received the legion of merit award on Okinawa and was promoted to a full colonel for his exceptional work in training and equipping medical units for the Leyte amphibious operation in the Philippines. Colonel Kamish is a graduate of the university of Minnesota.

In order to keep up with the standards of the American Medical association, North Dakota will need 12 additional practicing physicians in the state. Today there is one physician for every 1,994 persons.

The Public Health League of Montana has opened permanent offices in Helena, announces Mrs. H. W. Peterson of Billings and president of the organization. The setting up of permanent facilities for carrying out the league's purpose of promoting the highest standards of public health was decided upon by the board of directors, representing medical men, dentists, optometrists, pharmacists, hospitals, nurses, and lay groups devoting themselves to the prevention of the communicable and contagious diseases.

The league will serve as a clearing house for public relations activities of the various affiliated groups, aid in conducting programs of information regarding affairs and activities which affect public health, co-operate with existing public health agencies and protect the interests of the public through health campaigns, crusades and activities, the president explained.

Directors of the league, which was incorporated nine months ago, are Mrs. Peterson, field commander for the northwest region of the American Cancer Control Army; Milo F. Dean of Great Falls, representing the Montana Hospital association; Dr. J. M. Flinn of Helena, Montana Medical association; Mrs. Frances Macdonald of Great Falls, Montana State Nurses association; Dr. E. A. Kuntz of Helena, Montana Optometric association; George Gosman of Dillon, Montana Pharmaceutical association; Dr. Harvey Fearn of Bozeman, Montana State Dental association; George Hutton of Billings, Montana Tuberculosis association; the Rev. Frank L. Harrington of Butte, Catholic Hospital association; the Blue Cross Hospital Service association, and J. L. Markham of Butte, director at large. The Rev. Harrington is vice president and Milo F. Dean, secretary-treasurer.

Dr. E. J. Tanquist of Alexandria, Minnesota, is general chairman for Minnesota's 24th annual Resorters' golf tournament, to be held August 1 to 5 on the famed Alexandria Golf Club course (all-watered, 18 holes).

Dr. Neil M. Leitch, formerly of Warroad, Minnesota, has established practice at Kalispell, Montana.



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For external application only, each 100 Gm. of 'Caligesic' Ointment contains: Calamine, 8.00 Gm.; Benzocaine, 3.00 Gm.; Hexylated Metaresol, 0.05 Gm. Supplied in 1½ ounce tubes.
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CALIGESIC

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It has been decided that the House of Delegates of the Montana State Medical association will meet in Helena July 14 and 15, Saturday and Sunday.

The annual meeting of the women's auxiliary to the Minnesota state medical association was held in St. Paul May 17 and 18. Dr. William A. O'Brien of the University of Minnesota spoke on "The Evolution of Medicine" at the annual luncheon.

During 1944 more than sixteen million patients—approximately one of every eight persons in the United States—were admitted to hospitals. Hospital service in the past ten years has more than doubled. "The great increase in hospital service in recent years is due to an increase in public understanding of the importance of good hospital and medical care, rather than to an increase in illness" states the American Medical Association.

A questionnaire was recently sent to medical officers and a study of 35 per cent of those on duty in the Army, Navy, public health service and veterans' administration showed that nearly sixty per cent want to take six months' or longer courses of further training in hospital or other educational work after the war, and sixty-three per cent want to become certified specialists. The ten most popular fields in order of frequency for which requests for training were made are: surgery, internal medicine, obstetrics and gynecology, general review, psychiatry and neurology, pediatrics, orthopedics, ophthalmology, radiology and otolaryngology.

Funds for the building of a nonprofit, cooperative hospital at Ronan, Montana, have already reached \$17,000. The approximate cost of the building is estimated at \$75,000. A bond issue of \$50,000 has been authorized and only \$8,000 remains to be raised before construction will be started. The plans call for an entirely modern hospital which will be approved by the state health authorities, and is sponsored by the three Protestant churches of the community. An interesting item is that the farmers have subscribed generously and seem especially interested in the plan to operate it cooperatively.

HONORARY DEGREE FOR DDT RESEARCH DIRECTOR

Basle University, Switzerland, has conferred the honorary degree of Doctor of Medicine upon Paul Laeuger, technical director of J. R. Geigy, the Swiss organization which brought out the insecticidal properties of DDT. The award to Laeuger was made for his work in Gesarol, Neocid and other DDT compositions.

Neocid is a composition which was used with great success combating typhus in Naples and is now being used against the malaria mosquito in the Pacific. Gesarol is a DDT composition used against agricultural pests.

The bestowal of a medical degree on Dr. Laeuger recalls that staff members of the office of the Surgeon General of the Army have extolled the exceptional properties of DDT in the prevention of certain dreaded diseases among troops and civilians in battle areas. (See JOURNAL-LANCET lecture by Brig. Gen. Jas. S. Simmons, in February issue.)

Clyde Harold Fredrickson, MC, Missoula, Montana, has recently been promoted from lieutenant colonel to colonel.

Dr. L. M. Hammer, Two Harbors, Minnesota, has reported to San Francisco for active duty with the navy, having received his commission as lieutenant, senior grade, with the naval reserve.

On July 27 the Army medical department will observe the 170th anniversary of the establishment of the first medical service for the American army. The medical department had its inception in the creation of a hospital by the continental congress shortly after General Washington assumed command in the Revolutionary war.

Fall Refresher Course in Laryngology, Rhinology and Otology at University of Illinois College of Medicine

The University of Illinois College of Medicine announces its sixth semi-annual refresher course in laryngology, rhinology and otology, September 24 through September 29, 1945, at the college, in Chicago. The course is intensive and largely didactic, but some clinical instruction is also provided.

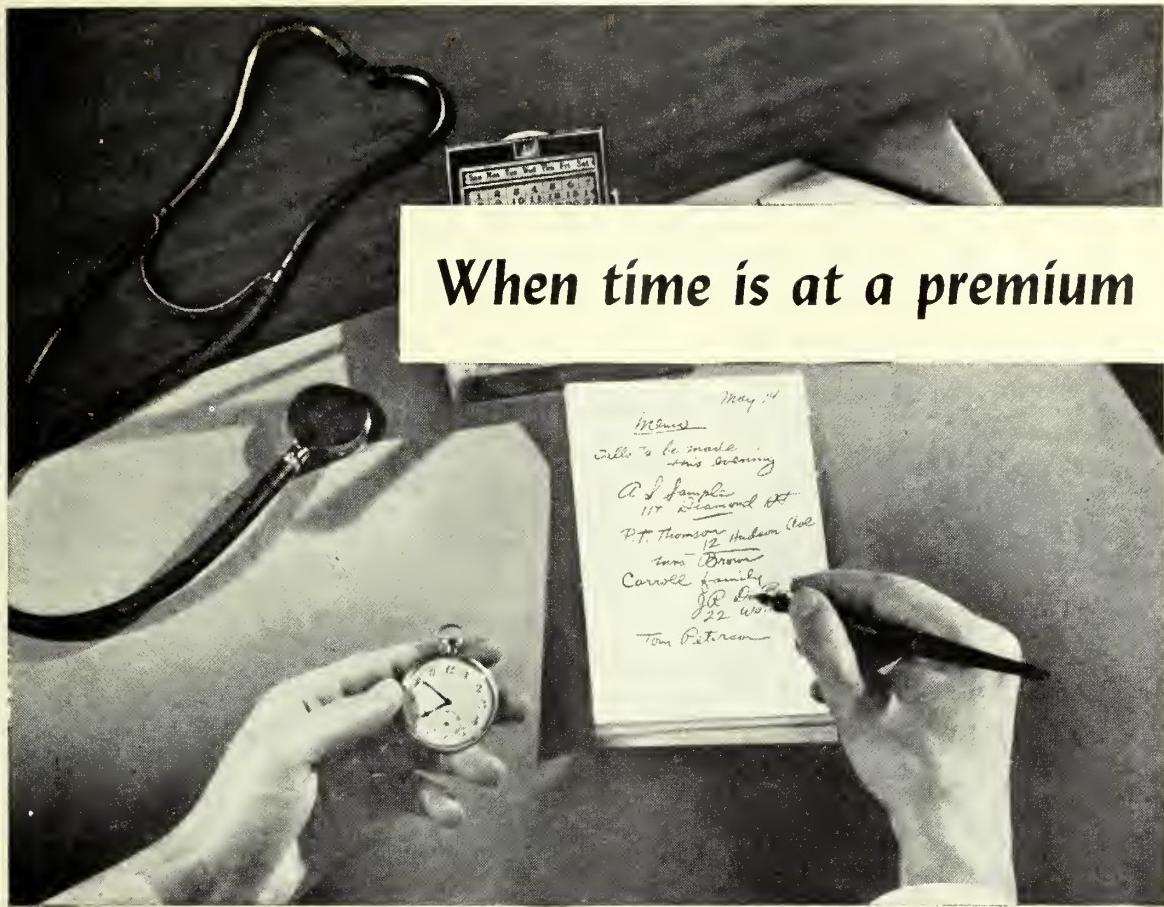
It is especially suited to specialists unable to devote a longer period for advanced instruction and to others seeking a comprehensive review of the field of otorhinolaryngology. The number of registrants will be limited. It is therefore desirable to apply for registration immediately. The fee is \$50. When applying, give full details as to school and year of graduation, postgraduate training, college degrees, etc. Write to Dr. A. R. Hollender, chairman, Refresher Course Committee, Department of Otolaryngology, University of Illinois College of Medicine, 1853 W. Polk St., Chicago 12, Illinois.

Necrology

Dr. Max W. Alberts, 46, St. Paul, Minnesota, died suddenly June 11, while driving his car after completing an operation at St. Joseph's hospital. Dr. Alberts was associate professor of surgery at the university of Minnesota, associate chief of surgery at Gillette state hospital for crippled children, and a member of Ancker, Miller, St. Joseph's and St. John's hospitals of St. Paul. He was physician for the St. Paul baseball club.

Dr. W. M. Dodge, Farmington, Minnesota, 78, died in Miller hospital after a prolonged illness. Dr. Dodge was one of the county's earliest physicians.

Dr. A. H. Bouman, 75, Minneapolis, died June 19 in Minneapolis. Dr. Bouman was born in Germany and received his academic education there, graduating from the University of Minnesota Medical School in 1897. He was a member of the American College of Surgeons and a well-known practitioner in Minneapolis.



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Aznoe's, established in 1896, has available a number of well trained physicians (diplomates of the specialty boards, industrial physicians and surgeons, general practitioners, psychiatrists, tuberculosis specialists and residents). For histories, write Ann Woodward, Aznoe's Woodward Medical Personnel Bureau, 30 North Michigan Ave., Chicago 2, Ill.

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1) Operating sterilizer, electric, volt 110, from Wilmot-Castle Co., Rochester, N. Y., original cost, \$232; 2) Intratherm short wave apparatus, Paul E. Johnson, Chicago, model 17 P, original cost, \$450; 3) Burdick colonic lavage apparatus, original cost, \$150; 4) one polariscope, Franz Schmidt & Haensch, Berlin, cost price, \$100; 5) one wood examining table; 6) obstetrical instruments at 50% of catalog list price. For inspection phone Dr. E. Klaveness, St. Paul, Nestor 6707, between 2 and 5 p. m.

FOR RENT

Available July 1st, doctor's office, good south Minneapolis location on streetcar and bus lines. Heat and hot water furnished, step-on faucets, portable telephone plugs, buzzer system. Beautifully decorated; venetian blinds; indirect lighting. X-ray and developing rooms. Reasonable rent. Owner, S. Holland, 3615 - 18th Ave. South, Minneapolis 7, Parker 2249.

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Roosevelt electric outdoor motor chair for amputee unable to use artificial limb. Electric charger accompanies chair. New, the chair sells for \$325 f.o.b. Chicago. Has had four months use; in very good condition. Will sacrifice and can make immediate delivery f.o.b. this east central North Dakota point. Make an offer, addressing Box 822, care of this office.

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"THE DOCTOR FIGHTS"

Schenley Laboratories, Inc., is presenting a twelve-weeks series of broadcasts over the Columbia Broadcasting System; the first on June 5 at 8:30 P.M., C.W.T. The series, entitled "The Doctor Fights," features leading Hollywood dramatic motion picture stars in half hour dramatizations of the actual feats accomplished by medical officers of the armed forces during World War II. In many instances, the actual surgeons or physicians whose deeds will form the highlight of the dramatic program are themselves heard in the broadcasts. Included are such instances of extraordinary devotion to duty as those of Major Livingston Pope Noell, Jr., the physician who elected to stay with the litter cases on Bataan when the hospital unit and all the nurses were evacuated to Corregidor, the heroic three days in July last year when Captain James E. T. Hopkins treated 80 casualties during the battle for the Munda air strip on the Solomon Islands, and other similar case histories from actual service files.

WYETH ADVERTISING CITED

With paintings occupying four of the three hundred places set aside in the "human interest" group, at the 24th Annual Exhibition of Advertising Art, held in New York from April 10 to 29, inclusive, Wyeth, Incorporated, of Philadelphia, has again scored heavily with the experts. Each of these paintings dramatically emphasized the Wyeth message to consumers: "Save your doctor's time in wartime."

"But it's my last night, Dad—can't another doctor go?" is the G. I.'s appeal in one of this series, which, in addition to recognition by the Art Director's Club, has been chosen for inclusion in the hundred outstanding advertisements to receive Wartime Advertising Awards.

LYNORAL—NEW ORAL ESTROGEN

Roche-Organon, Inc., manufacturers of endocrine preparations, recently announced to the medical profession a new oral estrogen preparation called Lynoral. Lynoral is ethinyl estradiol, the most effective estrogen for oral administration. It is closely related in chemical structure to alpha-estradiol, the natural follicular hormone, yet does not lose its efficacy when given per os. The majority of investigators have evaluated its therapeutic efficacy as at least 5 to 10 times that of stilbestrol. Most patients can take Lynoral with no complaint of undesirable by-effects. Even in those few patients who may develop gastric symptoms, the symptoms usually disappear promptly when the dosage is reduced to its minimal effective level. Lynoral is indicated in the menopause, infantilism, senile and juvenile vaginitis, and other disorders responsive to estrogen therapy. A daily dosage of 1 to 3 Lynoral tablets (0.05 to 0.15 mg.) usually elicits an excellent response from the menopausal patient. Recent clinical studies indicate that the experimental use of Lynoral may be of value in the symptomatic treatment of prostatic carcinoma. Lynoral is available for the physician's prescription in bottles of 30, 60, and 250 scored tablets, each containing 0.05 mg. of ethinyl estradiol. Descriptive literature will be furnished upon the request of the physician.

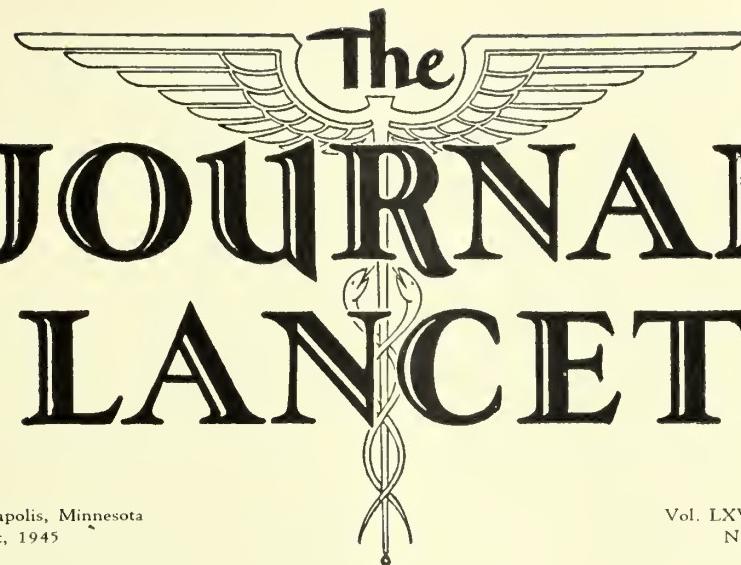
NEW STRENGTH GLOBIN INSULIN (Burroughs)

As a result of the widespread demand from the medical profession, Burroughs Wellcome & Co. have released a new strength of "Wellcome" globin insulin with zinc, 40 units in 1 cc., in vials of 10 cc., list price \$1.15. This strength is particularly suitable for the milder cases of diabetes where fewer units are needed for diabetic control. This new product is readily identified by its distinctive red and tan label. The original packing of 80 units per cc., vials of 10 cc., will be maintained for use particularly in the moderate and severe cases of diabetes and is identified by its characteristic green and tan label.

UPJOHN EDUCATIONAL CAMPAIGN ON RHEUMATIC FEVER

The sharp increase of rheumatic fever among children and its prevalence among our armed forces have centered considerable attention on this serious medical problem. In New York City alone, rheumatic fever is reported to kill five times as many children as six common reportable diseases combined.

To cooperate with physicians, public health services and the newly formed council on rheumatic fever in fighting this crippling disease, The Upjohn Company devoted its "Your Doctor Speaks" message in May issues of Saturday Evening Post, Time, Parents' Magazine and other national publications to a challenging appeal. Facts of vital concern to readers were given. Since early diagnosis and medical care are highly important in reducing the severity of attacks, heart damage, and mortality, the Upjohn message asked the readers to "work with your doctor in conquering rheumatic fever." Readers were advised to call the doctor immediately when signs such as fleeting pains in the joints, fever, or jerks in arms and legs appear. Readers were told to follow the doctor's instructions carefully to help avoid recurrence, and to have the child examined regularly. Physicians, public health men, and national organizations were invited to contribute suggestions while the Upjohn advertisement was being prepared. Letters to the company expressed appreciation not of the text alone, but of the beautiful full color illustration by John Koch depicting a typical scene in the life of a child with rheumatic fever, a tired-looking little girl patient receiving a visit from playmates.



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The Kenny Concept and Treatment of Infantile Paralysis

*Report of Five Year Study of Cases Treated and Supervised
by Miss Elizabeth Kenny in America*

John F. Pohl, M.D.[†]

Minneapolis, Minnesota

IN May 1940 Miss Elizabeth Kenny of Brisbane, Australia, after a satisfactory and interest arousing demonstration of her methods to medical men, accepted the invitation of the Minneapolis General hospital to establish a clinic in the hospital for the purpose of demonstrating her concept of the neuromuscular symptomatology of infantile paralysis in the acute stage and of its treatment as devised by her to combat these symptoms. The first group in 1940 consisted of 26 patients.

It was the privilege of the author to observe and study these first patients and all subsequent admissions and to record the progress of the individual cases. These first cases were reported in detail¹ together with a highly complimentary statement commending the advantages of the management of the patients according to the Kenny technique. Almost five years have now elapsed, a sufficiently long period to have reached definite conclusions by constant observation of this work. During this time the Elizabeth Kenny Institute has been established, giving added facilities with a permanent staff, for the

primary purpose of continuing the Kenny treatment of infantile paralysis exactly according to the technique established by Miss Kenny. Two trained Australian technicians, Miss Valerie Harvey and Mr. S. W. Bell, were brought to America to assist Miss Kenny in training a group of American technicians to staff the hospital. A total of 364 acute cases have now been admitted and treated in this clinic. A study of these cases, all supervised by Miss Kenny and treated by her trained staff under constant medical observation, constitutes a means by which an absolutely fair appraisal of Miss Kenny's work can be attained at this time.

The author in his first report¹ was enthusiastic about the work because the patients were so much more comfortable under the Kenny regime and because so many of the serious sequelae of the disease, especially deformities, appeared to have been eliminated. Continued observation of these early cases together with the experience of the succeeding years has served to increase this early enthusiasm and to prove the great merit of the Kenny methods. All patients who have remained for adequate treatment have made entirely satisfactory and remark-

[†]From the Elizabeth Kenny Institute, Minneapolis, Minnesota.

An increase of nearly fifty per cent in the number of poliomyelitis cases for the first five months of 1945 compared with the corresponding 1944 period brings consideration of this disease to the fore at the period when it is usually at its height. The greatest increase in number of cases (1270 in the United States through June 30, compared with 1002 last year), was in the middle Atlantic states, where the number rose from 43 to 178. July 1944, Journal-Lancet published a poliomyelitis issue. January 1945, this journal reproduced a report on the status of poliomyelitis treatment at Minneapolis General Hospital. In this issue we continue the discussion of the disease with Dr. Pohl's paper.

ably good progress considering the destructive and disabling nature of this disease. Most gratifying has been the fact that the gross and unsightly deformities which were common in previous years have not materialized in the Kenny treated cases.

The most significant point in Miss Kenny's work is that of a new concept of the neuromuscular symptomatology of the disease. It is impossible to comprehend the purpose or intention of the treatment unless these symptoms are clearly understood. The Kenny concept of infantile paralysis has been adequately described.² This concept can be contrasted with the traditional or what has been termed the orthodox concept. Orthodoxy has always regarded the disease as essentially an affection of the central nervous system, with flaccid muscle paralysis and other sequelae in the peripheral structures being considered as purely secondary to the central nervous tissue damage. This concept was developed largely by standard laboratory procedures conducted on post mortem material. Miss Kenny's concept is built upon intensive clinical study of cases in the acute stage of the disease and holds that the disease is primarily and most importantly an affection (spasm) of the peripheral structures, principally the muscles and their fascial coverings but including the skin and subcutaneous tissues, and that disturbing functional changes in the central nervous system occur secondarily (alienation, incoordination). This theory does not deny that the central nervous system becomes structurally involved and in fact accepts this as inevitable in some cases, but it does place an entirely new emphasis upon the treatment of the disease.

The general acceptance of Miss Kenny's discovery of muscle spasm as an entity in the disease³ would seem to place an indigestible issue before the proponents of the orthodox concept of a purely flaccid paralysis both in theory as well as in application of treatment. Since the two views are so widely divergent, in fact directly opposite in conception, it is imperative that this subject be made the basis of study in the scientific laboratories. However, acceptance of new treatment rests not on laboratory confirmation of theories but rather on the demonstrated efficacy when applied to the victim of the disease. From the experience gained in this clinic it has been proven that the results of the Kenny treatment are far superior to those obtained by any previously known method and therefore the results would clearly indicate that the Kenny theories are more reasonable than the orthodox, since the Kenny treatment is based on conditions not previously recognized.

The Kenny treatment is based upon the concept that the disease is principally peripheral in nature and that early intelligent nursing of sick muscles is imperative in preventing permanent irreparable damage to these structures. An essential requirement of the Kenny approach to the restoration of mobility is knowledge of the resting length, composition, construction, elasticity, architecture and contour of the principal individual muscles and a clear understanding of the relationship of the muscle to the nervous system as well as intimate knowledge both of the individual muscle action and the coordination of all muscles related to a part of the body in the formation

of motor patterns. Kenny treatment makes full use of all of these factors in securing the greatest possible recovery to the damaged mechanism. Restoration of cerebral design for locomotion is the principal objective rather than muscle power. It is obvious that statements of recovery of Kenny treated cases based on the above elements cannot possibly form a common ground for comparison of end results of previous methods of treatments which were based on recovery in terms of muscle strength alone. The Kenny methods are not primarily concerned with muscle strength as this factor is of little importance in the restoration of the body to functional activity. It is common to see Kenny treated patients walking without the use of braces and with a rhythmic gait in spite of marked loss of muscle power in both lower extremities. Strength of muscles is of little or no importance in dealing with the prevention of deformity. Yet orthodoxy clings to this outmoded attitude toward the disease in spite of the very convincing evidence to the contrary which has been presented by Miss Kenny. The most recent article⁴ dealing with the evaluation of different methods of treatment of the disease lists 20 variables by which it is proposed to measure the recovery of the patient from an attack of infantile paralysis. Sixteen of these variables deal with muscle strength and the other four deal with bone atrophy and psychological impact. It is further proposed that a standardized form of muscle test chart be adopted by all clinics treating infantile paralysis. The authors (McIntosh, et al.) of this recent paper overlook the skeletal deformities, braces, and surgical operations which are the real criteria of the crippling effects of the disease and the real measure of the success or failure of treatment.

The orthodox treatment can be summarized because it consists of procedures designed to combat the traditional or orthodox concept of the symptomatology of the disease, that is that the principal finding in the disease is muscle weakness or paralysis. The weakened muscles have been protected by splints and the splints supposedly served a second purpose of preventing deformities by compensating for the weakened muscles. As the disease subsided the emphasis was placed upon exercise in an attempt to strengthen the weak muscles. Deformities were considered to be due to muscle imbalance or strong normal muscles pulling against weakened ones, but since this was an essential feature of the disease, that there should be an irregular distribution of weakened muscles, the deformities were accepted as an inevitable aftermath of the disease. Various modifications of the orthodox treatment have been employed, differing usually according to the degrees of immobilization but all agreed in general principle. The orthodox treatment undoubtedly lessened the amount of crippling from the disease, although even this is seriously questioned by supporters of the orthodox methods,⁵ but in the main it failed, as is evident from the great number of deformed and crippled victims of the disease in previous years. This treatment failed because damaging symptoms in the disease were unrecognized and because it was designed for conditions which do not exist in the disease, among them

being the premise that deformities are due to muscle imbalance.

The Kenny concept holds that deformity is the result of the shortening of muscles in spasm when they are untreated, and proceeds directly to prove the correctness of this statement by preventing deformities in spite of weakness or imbalance of muscles. It can be stated without qualification that it is possible to prevent practically all gross deformities if treatment is carried out properly beginning early in the disease. The other symptoms described by Miss Kenny, namely incoordination and alienation, were neither recognized nor treated in the orthodox management of the disease but these conditions are detrimental to the patient's recovery unless properly handled. The highly skilled methods of neuromuscular therapy evolved by Miss Kenny have proven to be a rational and effective method of treatment by the real test, the test of time.

As an example of the efficacy of the Kenny concept and management of infantile paralysis, one particular set of muscles can be selected for intimate consideration. The abdominals are particularly adapted to such study since their action is not concerned with the function of any one single joint, and the action of this group of muscles is relatively simple to observe. The abdominal muscles are very noticeably affected by the condition of the opposing spinal muscles which are invariably in spasm in the acute stage of the disease. This relationship between abdominal and spinal muscles was previously unrecognized. Inability or difficulty of the patient in raising himself to sitting from the supine position was a frequent finding and was considered in the past as proof that the abdominal muscles were weakened or paralyzed by the action of the disease upon the spinal cord.¹⁶ Recovery of the strength of the supposedly weakened abdomen was sought by treating the abdominal muscles under the orthodox management of the disease, without discovering that the supposed weakness was largely due to an entirely different condition, that of spasm of the spinal muscles.

Examination of the patients in this Kenny series discloses that only 2 per cent of the patients were able to raise themselves from the supine to a sitting position in the acute stage of the disease and that 98 per cent therefore apparently had weakened abdominal muscles according to the accepted test for strength of these muscles. Of the entire group who have completed treatment only 2.8 per cent retain significant weakness of the abdominal muscles. NONE of the patients wear abdominal supports, including two patients with practically complete abdominal and spinal paralysis as well as complete paralysis of both legs. Both of these two patients sit up unaided, both are able to stand and one stands easily without support. The very high percentage of recoveries of the abdominal muscles in the Kenny treated cases can lead to but one conclusion, that the apparent paralysis is a functional disorder rather than an organic one and that restoration of function to these muscles depends upon recognition of the true cause of apparent loss of function. No known treatment would restore the abdominal muscles to power if the supposed weakness were

actually due to destruction of the co-related neural cells in the spinal cord. This conclusion seems most certainly borne out by previous records of an internationally recognized authority¹⁷ who stated that 72 per cent of patients in the acute stage had abdominal muscle paralysis in a series of 948 cases. A later examination of patients by this authority disclosed that 44.8 per cent still had evidence of abdominal muscle paralysis. In the series of Kenny treated cases only 2.8 per cent have significant weakness of the abdominal muscles upon completion of treatment although 98 per cent apparently had weakness of these muscles when examined in the acute stage. Alienation as here explained in relation to the abdominal muscles is an important cause of apparent paralysis of muscle, as discovered by Miss Kenny, and the effective means of relieving the condition accounts for the very marked difference in recovery of muscle function in the Kenny treated cases as compared with the orthodox.

The normal distance between the ribs and pelvis in the natural supine or standing position of body alignment constitutes the normal resting length of the abdominal muscles, within which distance these muscles are able to perform their function in the most efficient manner. Any condition which increases this distance and which thus puts the abdominal muscles on stretch, such as lordosis, would interfere with the function of the abdominal muscles and they would appear to be weakened. This is exactly what has happened in the past. Lordosis which we know now to be due to spasm and shortening of the spinal muscles or forward tipping of the pelvis due to shortening and contracture of the anterior thigh structures, has been a frequent condition in infantile paralysis. The effect in such case has been that the abdominal muscles appear weak and were often in the past adjudged as paralyzed whereas they are merely being discouraged or alienated by being pulled beyond their normal resting length. The orthodox treatment was to apply support to the supposedly paralyzed abdominal muscles.

By quite the reverse reasoning the Kenny concept demonstrates that treatment of the shortened spinal muscles in spasm and the restoration of the body to natural alignment and the abdominal muscles to their normal resting length will usually permit function to be restored to abdominal muscles which are not working. This exposes the crux of the controversy of the orthodox versus the Kenny concept of the disease. The orthodox method attempts to aid supposedly weak abdominal muscles by treating the abdominal muscles while the Kenny method successfully attacks the problem of restoration of function to the abdominal muscles by treating the spinal muscles.

Spinal deformities are definitely not caused by weakness of abdominal muscles but quite the reverse is true, that the apparent weakness of the abdominal muscles is caused by spinal deformity. Spinal deformity is caused by shortening of spinal muscles due to lack of treatment of spasm in these muscles in the acute stage of the disease. Scoliosis or lateral curvature is usually caused by shortening of the spinal muscles of one side or the other. Untreated spasm of the right spinal muscles causes a

left scoliosis and loss of function (alienation) of the left abdominal muscles, and vice versa for the structures on the opposite side of the body. The truth of this highly important discovery can be proven simply by the fact that NO patient has developed a fixed scoliosis in this entire series of properly treated patients extending over a period of five years. No patient wears an abdominal or spinal support of any kind. This is an amazing and unprecedented experience. Contrast this experience in using the Kenny methods with the following recent statement⁵ from another clinic in which the best known previous methods were employed in attempting to prevent scoliosis by treating supposedly weak abdominal muscles in a series of 160 acute cases:

"Any patient who showed any indication of abdominal involvement was fitted with a Hoke type of corset before being allowed to sit up. In spite of this precaution, a definite scoliosis has already developed in twenty-one of these patients, or in about 13 per cent of the total series. In two cases with distinct unilateral involvement, fascial transplants to the abdominal wall have been used in an attempt to splint the weak side and prevent further increase in the deformity, but insufficient time has elapsed to make any statement in regard to the result."

The above quotation demonstrates the misdirection and futility of the orthodox procedures and emphasizes that the orthodox concept of deformity, as being due to muscle imbalance, is obsolete and should be discarded. These results of orthodox treatment again point out the divergence of the orthodox versus the Kenny concept of the disease. Orthodoxy treats the abdominal muscles in an effort to prevent spinal deformity while the Kenny method treats the spinal muscles successfully to prevent the same deformity. Both cannot be right but the indisputably superior results obtained by treatment based on the Kenny principles testify to the soundness of the Kenny concept of the underlying cause of deformities.

The mechanism of the cause of deformities as just described, using the spine and the muscles of the trunk as an example, is applicable to the entire body. Spasm is an active and forceful process affecting muscles and their fascial coverings which may occur in any of the muscles of the body. The affected muscle and its investing fascia are shortened by the spasm. The resulting pull of the shortening muscle causes a disalignment in the skeletal part to which this muscle is attached. If the spasm is not recognized early and properly treated the disalignment becomes a permanent deformity, as the muscle and fascia in spasm passes irrevocably through a period of contraction and finally into a stage of inelastic contracture. Appropriate treatment as employed by the Kenny methods successfully relieves the condition of spasm and thus prevents deformities as the experience in this clinic has so well proven.

The muscle opposed to the one in spasm, wherever it occurs in the body, is usually disturbed by the resulting skeletal disalignment and frequently appears to have lost its power of contracting entirely. This is the condition of alienation, a physiological dissociation between muscle and nervous system, a pseudoparalysis which was previously unrecognized and mistakenly considered to be true paralysis. Returning the skeleton to normal alignment by relieving muscle spasm permits restoration of

function to alienated muscles and for this reason it is reasonable to claim that the Kenny method appreciably improves the recovery of muscle strength of the patient. Alienation has undoubtedly been the cause of much supposed weakness and paralysis in patients treated by the orthodox methods in the past.

Miss Kenny has so decisively proven her thesis that spasm is an important part of the symptomatology of infantile paralysis in the acute stage that it is necessary to re-appraise all conditions in the disease and also the treatment for these conditions which orthodoxy established on the basis of the flaccid muscle concept. This is especially true of the respiratory mechanism, the disturbance of which is so frequently the cause of death in infantile paralysis.

It is now obvious that spasm frequently affects the muscles of respiration and those muscles associated with the respiratory tract such as the posterior neck muscles, the spinal muscles, the shoulder girdle muscles along with the intercostal muscles, the diaphragm, the abdominals, the sternomastoids and other anterior neck muscles, as well as the pharyngeal and laryngeal muscles proper. Spasm may affect any of these muscles and the pain and immobilizing effect of the spasm is frequently the cause of respiratory difficulty. This has not been recognized in the past and those patients presenting embarrassed breathing were invariably thought to be suffering from weakness and were frequently placed in the respirator. Many such cases are still in the respirator years later.

In the type of case where the respiratory mechanism is affected by spasm, failure to treat the affected muscles during the acute stage very much diminishes the possibility of restoring good functional use to the affected respiratory muscles because the untreated spasm plus the respirator combine to permanently damage these tissues to the extent that treatment is useless. Where the respirator is improperly used as in those patients suffering from spasm of the respiratory system, the respirator has a damaging effect. The mechanical effect of the respirator in lifting the rib cage aggravates the condition of spasm of the chest muscles and the affected muscles tend to become hard and inelastic so that the rib cage is like a solid box. It will also be noted that the constant lifting of the rib cage by the respirator causes the lower ribs to become permanently elevated or splayed. This condition has the effect of interfering with the action of the intercostal chest muscles as well as the abdominals.

Treatment by the Kenny procedures of the condition of spasm in the affected respiratory muscles in the acute stage by the use of hot fomentations and the restoration of the confidence of the patient in his own respiratory mechanism by teaching him the rhythm of breathing is a much more rational procedure than placing him in a respirator. Patients in the acute stage of the disease suffering from spasm of the muscles of the respiratory mechanism may die regardless of the treatment given them but they will die in the respirator as well as out of the respirator. Many of those left out who are treated by hot fomentations and other Kenny nursing procedures can be saved.

The experience with the respirator in this clinic is arresting. During the past five years there have been 23 deaths from acute poliomyelitis, a fatality rate of 6.3 per cent. Ten patients died outside the respirator and 13 died in the respirator. No patient survived being placed in the respirator. The procedure followed was that the patient was examined for evidence of spasm of the neck, throat, dorsal spine, and chest area and treatment was instituted to relieve spasm present, along with other measures designed to clear the respiratory passage. In any instance where it was obvious that these measures were not aiding the patient he was placed in the respirator at the discretion of the medical staff. Those patients in whom satisfactory oxygenation could not be maintained by any means outside the respirator were invariably placed in the respirator. All of these patients improved for a short time when placed in the respirator but all invariably died. The Kenny treated patients who had respiratory difficulties and who survived all have normal function of the respiratory system.

There are some patients who do have a true paralytic affliction of the throat and respiratory muscles, presumably due to involvement of the related portion of the spinal cord. These patients are observed to be very limp and to tend to become comatose without great effort on their part to secure air. Frequent swallowing motions appear to be an attempt to imbibe air. The apathetic and semi-comatose patient of this type may be benefited and life prolonged or even saved by the use of the respirator but this type of condition is rare.

Physiotherapy has been defined as the science of treatment by the use of the physical forces of nature. In the very acute stage of infantile paralysis the Kenny method employs the use of heat and moisture as part of the superb nursing care of the patient and for the purpose of securing relaxation in the affected parts. The therapy employed in the Kenny technique to restore function to the damaged motor system can hardly qualify as physical therapy but rather as an advanced form of physical medicine which might be termed neuromuscular therapy. The techniques used require not only an expert knowledge of the action of individual muscles but also employ specialized means of restoring normal reflexes and patterns of motion to the central nervous system. Judging from the results obtained by the Kenny system in this clinic it can be stated that the methods are highly effective.

Attempts in other clinics to modify the Kenny methods and to develop a so-called "modern" treatment are apparently due to an incomplete understanding of the Kenny principles. These modifications, consisting usually of the addition to the Kenny methods of night splints to rest the muscles, or of day splints to assist standing, or supports to the trunk, or pool treatments, appear to be simply reversions to the old orthodox procedures. This is irrational because the orthodox methods were founded upon paralysis as the primary lesion of the disease and were thus designed for conditions which were quite the reverse of those for which the Kenny methods are designed. The combination cannot be an efficient form of treatment.

The Kenny method of re-education is based upon the fact that man is essentially master of his muscles and that he can adopt bad habits of muscle activity as well as good. Restoring the rhythmic relationship of the various movable units of the body to each other in forming the normal motor patterns of the cerebrum is highly important. Splints particularly tend to disrupt this mechanism because they induce in the mind of the patient an attitude of immobility. Pool treatment, including the small tank or Hubbard tub, should have no place in the therapy of infantile paralysis. The impracticability and impossibility of its application is evident. True re-education under water is impossible because it cannot be exact when the vision of the technician is obscured. Incoordination will not be observed and coordination will not be restored. The patient will freely substitute strong muscles for weaker ones with the result that improper motor patterns will be more firmly established and incoordination be made permanent. Immersion in water alters the normal gravitational forces acting upon the body because of the buoyant effect of the water. This is particularly important in connection with the trunk structures. The patient fails to be impressed by the necessity of acquiring good stabilizing quality in the trunk muscles and in fact does not appreciate the mechanism of stabilizing the body upright. He is, therefore, placed at great disadvantage when he is faced with the problem of coping with the direct forces of gravity as they affect his posture on dry land.

Considerable interest has recently been aroused in the use of drugs to help combat the muscle spasm of infantile paralysis.^{7,8,9} This is commendable although the evidence so far presented is conflicting and highly questionable as to the efficacy of the drugs used. The regrettable result of this work is that it has led to the naive belief that the simple release of muscle spasm automatically leads the patient to effective coordinated restoration of his motor system. This is unfortunately not the case. Regardless of the method of relieving spasm the patient must be retrained by someone who has an expert knowledge and skill in guiding the disturbed nervous system back to its proper state of function.

Infantile paralysis produces effects too profound to be corrected to any satisfactory degree by those with insufficient skill and training. The old physiotherapy dictum of heat, massage and exercise cannot be applied to this disease. Rather must the technician be far better equipped than in the past if the victims of the disease are to be given a fair chance for recovery. Experience has shown that the normally intelligent nurse requires a period of two years of training and experience to be confident in handling the problems of infantile paralysis. This has been amply demonstrated in this clinic by the increasingly better results obtained as the technician becomes more familiar with the multiplicity of details which the disease presents in different cases. This length of training period is partly necessary because of the seasonal incidence of the disease of infantile paralysis. The prospective technician becomes acquainted with the disease during her experience with the first epidemic but she must wait a year before she can again apply her first

knowledge to the handling of the acute case. A technician without nursing experience is at a distinct disadvantage in handling this disease as the treatment must be instituted in the very earliest stages when the patient is ill and in need of expert nursing care. The entire future course and eventual outcome of the patient is in most instances determined by the management of the case in the first several days of the illness. Only the most highly skilled and trained technician is in a position to give the patient the real benefit of this most advanced method of treatment.

RESULTS OF THE KENNY TREATMENT
AT THE ELIZABETH KENNY INSTITUTE
MINNEAPOLIS, MINNESOTA
1940-1944 (inclusive)

During the years 1940 through 1944 a total of 364 patients suffering from the disease infantile paralysis in the acute stage have been admitted and treated in the Elizabeth Kenny clinic, of which 341 survive and form the material upon which this evaluation of the Kenny concept and treatment is based. These patients have all been discharged from the hospital and may be considered to have completed treatment. All of the patients were originally admitted to the contagious wards of the Minneapolis General hospital and were diagnosed by the attending medical staff of that hospital before being transferred to the Elizabeth Kenny clinic for treatment. All of the patients were treated because all showed evidence of tissue spasm, now recognized as the most important condition affecting the body in the acute stage of the disease, and the most damaging if disregarded. The patients also showed evidence of palsy in the ability to contract muscles. This is frequently caused by pain and spasm in the muscles but 68 per cent of the patients in the acute stage were considered to have definite evidence of interruption of motor innervation either because of alienation or through damage of the central nervous system. Upon completion of treatment 16 per cent of the patients have extensive residual paralysis of one or more extremities but 84 per cent may be considered to have good recovery from the standpoint of muscle strength and the ability to move the limbs.

Relief of the condition of alienation through proper treatment gives a true picture of the result of actual motor denervation. The disease from the standpoint of paralysis seems to be more regional in character than formerly pictured, with weakness or paralysis appearing fairly generally in the part affected such as in the lower leg, the shoulder, or an entire extremity. The instances of isolated paralysis of a single muscle are much fewer than observed in former years when orthodox treatment was used. This condition was apparently a pseudoparalysis or an alienation rather than a true paralysis. The muscles in a region where evidence of true motor denervation exists are apt to be uniformly weakened or paralyzed although in some cases one or more muscles of that region may retain considerable strength.

In reviewing the general experience with the Kenny treatment year by year it should be stated that the cases in this series (1940 through 1944) were not mild ones

but were of average severity in comparison with previous experience in the same hospital.

In judging the final results of a disease so variable in its attack as infantile paralysis and the effectiveness of any form of treatment the only practical measurement is the degree of restoration of the patient to general useful functional activity as an individual with the prospect of self-support and independence. It should be perfectly obvious to anyone acquainted with the disease that the extent of retention or loss of muscle strength is not a practical guide to be used as a means of judging the effectiveness of methods of treatment. There is no treatment that will cure paralysis or resurrect dead nerve cells killed by the disease. A patient may be a success from the standpoint of retaining good muscle power but the same patient definitely represents a failure of treatment if he suffers permanent crippling deformities in spite of his good muscle strength, as was too frequently the case under the orthodox management of the disease. On this basis the Kenny treatment proves to be remarkably successful as 95.5 per cent of the patients in this series appear to have an assured future existence, free of cumbersome braces, grotesque deformities and awkward methods of locomotion. This does not mean that these patients are cured or all free of paralysis but rather that they have the potential ability to carry on a useful and independent existence. The other 4.5 per cent (15 patients) are by no means helpless or even necessarily crippled but are considered as having made an unsatisfactory recovery from the standpoint of having retained muscle weakness of such extent as to prevent them from being fully independent. None have gross deformities. All of the fifteen are able to walk although those with severe involvement of the lower extremities require some form of artificial assistance such as crutches, canes or braces. There are nine adults in this group and six children. The adults consist of one farmer, one draftsman, one mechanic, two clerical workers, two housewives, and two college students. Five of the adults wear braces. All of the nine adults are back at their regular work and may be considered as making their own way except one housewife and one college student; these two patients both with fairly complete paralysis of the trunk and lower extremities still need considerable assistance although both walk and are still improving. The six children who have made unsatisfactory recoveries from the standpoint of having retained considerable general muscle weakness are all able to walk without assistance. Three wear leg braces. All of the six attend school regularly.

Braces are worn by eight patients, or 2.3 per cent of the entire group of 341. Some of the patients who do not require braces do use other means of assistance in walking. Crutches only are used by 3.4 per cent of the patients and one cane is used by 2.8 per cent of the patients. For the most part the crutches are employed as a means of continuing to teach the patients good motor habits rather than as a means of support. Crutches are later displaced by a single cane in most patients or are discarded entirely.

The gross and humiliating deformities such as spinal curvature (scoliosis), torticollis, lordosis, pelvic obliquity,

joint dislocation, knock knee, valgus foot, varus foot, equinus foot, cavus foot, calcaneal heel, and joint contractures of previous years have been eliminated in all of the cases. Only three children of the total series of Kenny treated cases have shortening of a limb, the greatest amount being one-half inch, an amount which is immaterial.

Tissue atrophy is present in some patients but not nearly to the extent previously encountered. The annoying trophic and circulatory disturbances of the skin, coldness, excessive perspiration, purplish discoloration, ulceration, callous formation, and chillblain so frequently encountered in the past have been eliminated.

None of the patients has required surgery to date and no indication has arisen in which surgery might materially improve the condition of any of the patients.

The hospitalization experience is of interest. In regard to care the patients fall roughly into two categories, those with little or no residual paralysis at the end of treatment, and those with serious residual paralysis of one extremity or more. The former group, comprising 72 per cent of the patients, were hospitalized for an average stay of two months. The latter group, all of which had fairly extensive paralysis, were hospitalized for an average stay of 11 months. Only two patients of the entire group who have had Kenny treatment have required re-hospitalization and these only for the very limited time of three months. None of the 341 patients, including the severely involved, have entered orthopedic hospitals, rest homes or institutions for the care of the crippled and chronically disabled.

Infantile paralysis has been the great crippler of children. The orthopedic hospitals and schools for crippled children have largely been devoted to caring for the victims of this disease. Each child represents sorrow and tragedy for a family. Study of a crippled children's school in a community where infantile paralysis is commonly present and where the management of the disease throughout its course is in the hands of a relatively few doctors will give an overall picture of the infantile paralysis situation. Michael Dowling School for Crippled Children in Minneapolis permits a ready means of such review for study of the crippling effects of the disease. This is a public school operated by the city of Minneapolis for the care and education of all elementary age school children in Minneapolis who are afflicted with crippling diseases or unable to attend regular school because of physical disability. Children are referred to the school by private physicians or others who are responsible for the medical management of the individual patient. The same orthopedist has examined the patients on admission and supervised the care of the pupils during their attendance at this school since the year 1937. The general picture regarding infantile paralysis from 1937 through 1939 at this school can be directly compared with the general picture since 1940 which was the year Miss Kenny began her work in Minneapolis. This is summarized in the table.

TABLE
Treatment Comparison of Children 14 Years of Age or Under Afflicted with Infantile Paralysis and Eligible to Attend Michael Dowling School for Crippled Children, Minneapolis, Minnesota.

	Orthodox Treatment 1937 thru 1939	Kenny Treatment 1940 thru 1944
Number of Minneapolis children, 14 yrs. of age or under, afflicted with the disease	178	146
Number of this group of Minneapolis children finally enrolled at Dowling School as a result of having had infantile paralysis in the indicated years	57 (32% of the children afflicted in Minneapolis)	0
Number of this group of Minneapolis children with fixed gross deformities present at the time of entrance to Dowling School	45 (80% of those admitted)	0
Number of this group of Minneapolis children who had to wear braces at the time of entrance to Dowling School	15 (26% of those admitted)	0
Number of this group of Minneapolis children who have had surgical operations	12 (21% of those admitted)	0

The above figures from a crippled children's school graphically indicate the serious nature of the disease of infantile paralysis. The figures show that under the best known previous (1937 through 1939) methods of treatment in a large city that 32 per cent of the children afflicted had to have special provisions for their care and education; 80 per cent of those entering the school developed permanent deformities, 25 per cent of them needed braces and 21 per cent required surgical operations.

In very marked contrast, as is evident from the tabulated data, in the years 1940 through 1944 during which time the Minneapolis victims of the disease received Kenny treatment, the 146 patients of elementary school age fared quite differently by comparison. It has not been necessary to admit any of these Kenny treated patients to the crippled children's school. None have gross deformities and none have had operations. The Kenny methods should need no greater argument in support of their widespread adoption than the proven elimination of the major part of the crippling after effects of the disease of infantile paralysis.

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Observations on Tropical Disease*

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ONE science that is tremendously advanced by war is that of medicine. There is advancement not only in the management and control of infections, treatment of wounds, and in the field of plastic surgery, but also in our knowledge of diseases that were as foreign to us as our geography seems to have been. This war is making specialists in fields that many never expected to encounter. One does not become an authority in tropical medicine by one short tour in the tropics, but one does learn about diseases that are vague memories from the medical textbook. Each medical officer returning from the combat areas will have a different experience to tell when he returns, and each will have something more to contribute to the future of medicine. Our experiences seemed meagre and routine at the time, but in retrospect they become more and more interesting.

It has been emphasized, and should be emphasized again and again that the world is changing rapidly. Most important to the medical world is the fact that there is no point on the globe that is more than sixty hours away by air. This means that the possibility of seeing unusual and remote diseases here has increased greatly, and after the war when free intercommunication is established, there is the possibility that it may not be an uncommon experience to see these diseases throughout this country. This must be kept in mind, and it will add to the ever increasing list of diseases that one must consider in a differential diagnosis. This possibility may have reached some already, as I am sure that the study of malaria has become more popular since the return of a few of the men from the service to civilian life.

The recognition of the tropical diseases becomes easier as one becomes more familiar with the conditions, and it is important that those of us here in the United States be aware of the more important signs and symptoms should such cases present themselves to us. It is difficult to evaluate the clinical picture as it is presented in the standard textbooks of tropical disease, and it is for this reason that the outstanding clinical features of the diseases which were observed will be emphasized.

In spite of all that has been written about the difficulties in surviving on the South Sea Islands, one cannot realize just how many problems are encountered until one is face to face with them. Such simple things as eating, washing, and sleeping become major problems, and one of the first of the major problems that has to be met is that of feeding the men under sanitary conditions in a climate that invites food spoilage both day and night. The average temperature of the island where we landed is 80 degrees, and the yearly rainfall 190 inches. One would expect that the white man would soon become well tanned and look the picture of health, but instead he becomes pale, looks a little feeble, and

fatigues easily. The native, knowing how to live in the tropics, works but very little, enjoys his leisure, and particularly enjoys the tropical moon and the glorious tropical evenings. Wartime living does not permit such luxuries, and combat training, the construction of camps, transportation of food, ammunition, etc., go on twenty-four hours a day.

Our life of leisure ended when the convoy dropped anchor in the harbor, for it was then the unloading of the ships, the establishment of camp sites, and the feeding of the men began. We were fortunate, in that we were not the first to be assigned to the island, and the Marines who preceded us there had learned many of the necessary procedures for the maintenance of life. The housing problem did not bother the Marines. They doubled up where they could, set up tents if available, and many slept in the open for the first few nights without complaint though the rain was heavy. From the medical standpoint, the first major problem was that of feeding the men.

Diarrhea and dysentery are the main fears of the medical officer when he first lands on such a tropical island. We were all poorly informed, and perhaps this was fortunate, for we learned through experience and we learned fast. The day after landing, we were confronted with a number of cases of severe diarrhea associated with intense abdominal cramps. It looked like the beginning of a real epidemic of some sort; but our fears were soon alleviated when one of the corpsmen, experienced in the tropics asked the men if they had sampled the coconuts. Invariably the answer was in the affirmative, and our first lesson was that green coconut milk was one of the foremost causes of diarrhea. The word was passed that the men should refrain from eating coconuts, and that was the end of the first "epidemic." About two days later a second epidemic of "dysentery" appeared, and this was traced to the washing of the mess gear in the mountain streams. The cleaning of mess gear in the tropics has to be very carefully supervised, and with the available mess halls serving twice the number of men that they were set up for, the cleaning of the gear soon got out of control. The mess gear is cleaned before and after eating, and this has to be done in improvised sterilizing tubs made from half of an oil barrel. A fire is kept under the half oil barrel at all times, and the water is near to the boiling point. Because the line became so long and there was work to be done, the inexperienced went to the streams and washed their mess gear there. All streams must be considered contaminated, for in spite of war, military rule, and education, the native population could not be made to change their ways, and the mountain streams are natural privies in the minds of the natives and will always remain so. No specific cause for the diarrhea was found, but as soon as the men were

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required to wash their mess gear in boiling water, the second epidemic was under control.

In our particular location, we were not confronted with the severe dysentery that one encounters in the Southwest Pacific, but we did have a few cases, and the differential diagnosis of these is worthy of consideration. Having ruled out the above-mentioned causes for "dysentery," namely green coconut milk and unclean mess gear, then one has to consider the various types of bacillary dysentery, amebic dysentery, the typhoid fevers, and the diarrheas caused by the various forms of intestinal parasites. As one might guess, the means for laboratory diagnosis on such an island base are often not available, although it is surprising how good the laboratory facilities can be. For the most part, however, it became necessary to make the diagnosis on epidemiological and clinical features, and by the use of specific drugs. During a nine month period, one case of paratyphoid fever, and one case of amebic dysentery were encountered, and although these diseases had to be kept in mind, it was logical to consider other causes as more likely.

Bacillary dysentery is by far more common than amebic dysentery, and bacillary dysentery is usually epidemic rather than sporadic as is amebic dysentery. If food poisoning caused by the *Salmonella* group can be ruled out, usually by the absence of the relation to the ingestion of infected food, then the bacillary type of infection should be considered as the causative agent. If one is still in doubt, a therapeutic test by emetine should be used. If the diarrhea is amebic in nature there will be a striking improvement in the course of twenty-four to forty-eight hours. If no improvement, then it may be assumed that the diarrhea is bacillary in origin, and the use of sulfaguanadine or other of the sulfonamides may be started.

Before dismissing the diarrheas, three other causes must be mentioned. The first and perhaps the most violent and prostrating is the diarrhea caused by a very simple combination of lemon powder in solution placed in the outside container of the vacuum food carriers used to carry food to the men in the field. It is a very simple source to track down once one is aware of the disastrous effects of this combination, but it has caused many a medical officer many uneasy hours until he became aware of this unusual epidemiological factor.

Two rather simple infestations became troublesome to us as there was a lack of effective drugs for their treatment. The first of these infestations that was encountered was that of strongyloidiasis. Men were reporting in with persistent diarrhea, and rather severe abdominal pain. Many of these were thought at first to have appendicitis, and yet only one of these patients had his appendix removed unnecessarily. The diagnosis is not difficult and the ova can be easily recognized even by the inexperienced by reference to the drawings in the standard textbooks. The treatment, too, is simple if one has the available medicinal gentian violet in enteric coated capsules. One grain of gentian violet is given three times daily until 50 grains have been given. Lacking the desired enteric coated gentian violet, our ingenuity got the better of us, and we tried laboratory

gentian violet via the stomach tube only to find that it was extremely nauseating even in very small doses, and gentian violet does stain beautifully, completely, and permanently. The second infestation was that of the *ascaris*, *lumbricoides*. It occurs throughout the world, but is particularly prevalent in the tropics where the warm moist climate favors the embryonation of the ova in polluted soil. The parasite is 24 to 40 cm. in length and requires no intermediate host. It is well to review the life cycle of this parasite briefly. Following embryonation of the ova in the soil, the larvae are ingested in polluted water, and grow in the small intestine. They then penetrate the small intestine, reach the lymphatic system, and then are carried through the right heart to the lungs. Here, after a sojourn of several days, they usually break through the pulmonary capillaries into the air sacs and are carried up the bronchioles, bronchi, and trachea to the epiglottis and then are swallowed and pass down into the small intestine where they develop into adult male and female worms. This entire process takes eight to ten weeks, and the adult parasite will live in the human host for about one year. They produce little in the way of symptoms, but they may cause ulceration of the intestine, and may penetrate into the appendix, bile ducts, pancreatic ducts, nose sinuses, middle ear and larynx. If they grow in large enough clusters, they may produce intestinal obstruction. Treatment consists of either the use of hexylresorcin capsules, 1.0 Gm. given in the morning followed in two hours by a saline purge, or the use of oil of chenopodium. Oil of chenopodium is a dangerous drug, but under the stress of the emergency, it was used freely, but always with a saline purge, and no fatal results were encountered in many administrations.

The medical officers of the various units on the island made a sincere effort to maintain interest in medicine as well as military affairs and Sunday afternoon meetings were held at the various medical activities. One of the first of these was devoted to the subject of filariasis, which to most of us was another textbook memory, and was a curiosity because it was believed to be limited only to the native population. As may be recalled, filariasis is a disease caused by certain parasitic nematodes, the adults of which live in the circulatory or lymphatic systems, the connective tissues, or serous cavities, while certain larval forms, often termed "microfilariae," commonly invade the circulating blood or lymph spaces. The infestation results in a condition which is recognized as elephantiasis and it affects the extremities and the lymphatics of the spermatic cord resulting in elephantiasis of the scrotum.¹ The filariae possess an important biologic distinction from all of the other nematodes in that in all species whose development is known an intermediate host is required for the larval stage and one individual with the disease cannot infect another.

About the only thing we recalled about filariasis from medical school days was that it occurred in Charleston, South Carolina. We were soon to learn much more about it, for although we were of the opinion that the white man could not get filariasis, the natives, who are very friendly and observant people kept insisting that

some of our Marine patients had *Mumu*. As we saw more and more patients with a peculiar but definite clinical picture, it became more and more evident that the natives were right, and that they had recognized the early stages of the disease where we had failed. The microfilariae are carried in the Pacific islands by a mosquito, the pseudoscutellaris and the scutellaris, which bite both day and night. At the site of the mosquito bite there is a small area of inflammation which is followed by a lymphangitis which differs from other types of lymphangitis in that it extends toward the periphery, and is therefore termed a retrograde lymphangitis. This usually subsides rapidly under supportive measures of bed rest and local applications of heat, and shows no tendency to recur. A number of men who first reported in complained of pain in the testicles with extension up along the spermatic cord. After a period of a week to ten days in bed, the pain and tenderness of the cord disappeared, and the men were returned to duty. Many of these men found it impossible to do any hard work, and consequently were sent back into the field hospital for further treatment. When we became aware of the fact that there was an enlargement of the spermatic cord, or rather of the tissues about the cord, it was found that these men had a thickening of the cord of about one centimeter or larger. This enlargement was extremely tender and painful, and prevented the men from climbing, enduring long marches, and from doing any useful amount of work. As more and more became thus affected, the greater grew the necessity to establish the diagnosis accurately. A few of the men presented enlarged lymph nodes in the region of the breast, and many showed enlarged epitrochlear lymph nodes. As the blood stream showed no microfilariae in any of the cases, the removal of the enlarged lymph nodes in a few cases for study was believed justified. This was done, and the adult filarial worm was found in 100 per cent of the cases observed.

Elephantiasis does not result from one exposure to the disease, nor, in fact, from several exposures, but rather from repeated exposures over a number of years. There is no known drug that will harm the parasite without injuring the host, and the treatment of the disease in the native population consists only of the surgical removal of the redundant scrotum when this becomes necessary for the comfort of the individual and of incision and drainage of filarial abscesses should these develop. In the native, once elephantiasis has set in, there seems to be a certain unexplained periodicity to the disease, for there are recurring bouts of chills and fever. During such periods, which vary in occurrence from a few weeks to several months, the involved extremity becomes more edematous, tense, and painful. When the period of fever is over, the extremity shrinks, the pain disappears, and the patient returns to a normal life. The elephantiasis, however, remains a little larger than prior to the attack.

In regard to the treatment of the disease in its early stages, as we saw it in our personnel, all measures were directed toward symptomatic relief. The man was put to bed, the scrotum supported, and he was given seda-

tives as indicated. All of these cases were relieved of symptoms after a week or ten days in bed, and they were returned to duty. If they had a recurrence of symptoms they were readmitted and again treated by bed rest. If there was a further recurrence, they were then considered for transfer to the United States, for it is known that once these patients are in temperate climates there is a disappearance of symptoms. Those who were sent back to the States with definite enlargement of the spermatic cord arrived here showing no enlargement whatsoever.

It is anticipated that all of the men who contracted the disease will remain free of signs and symptoms as long as they remain in temperate regions. It is possible, however, from the evidence of previous observations on patients brought to New York from Haiti a few years ago, that some of the patients may experience some discomfort in the testicles during the warm summer months even in the temperate zones. Should such patients present themselves, the examination should be made with special reference to the presence of enlarged epitrochlear lymph nodes, and to the characteristic thickening of the spermatic cord. Both of these findings are extremely characteristic of the disease and are almost universally present. The epitrochlear nodes are discrete, freely movable, and run along the course of the brachial artery just above the elbow joint. The thickening of the cord is of a rubbery consistency, and, at first, will remind one of a small hernia or hydrocele, but it runs from the testicle through the external ring as far as one can reach with the examining finger. Enlargement of the testicle may be associated with the enlargement of the spermatic cord. If such cases are encountered, bed rest with support to the scrotum, and the use of proper sedation is recommended. In spite of a widespread misconception among the Marines, sterility has not been observed to result from this disease.

Our particular area was free of malaria and dengue fever which are mosquito-borne infections endemic in other parts of the South Pacific. A few cases of malaria were seen in those men who had been evacuated from other parts of the Pacific, and although the disease is of growing interest to all of us back here in the United States, it is necessary for military reasons that the information available to the service be withheld for the present. It is permitted, however, to alleviate some fears by mentioning that malaria is considered much as a bad cold by many medical officers in the South Pacific, and that the present-day methods of treatment are effective. For the present, it will be necessary to rely on the good standard treatments such as those set forth in Stitt's *Diagnosis and Treatment of Tropical Diseases*.

Dengue fever is a disease caused by a filterable virus, and is transmitted by the mosquito of the genus *Aedes*. It is characterized by an initial three or four day febrile paroxysm of a very sudden onset, a remission which comes on about the fourth day, and a terminal rise in temperature for two or three days. There is a severe postorbital soreness which is extremely characteristic of the disease as is the severe backache and the pains about the muscular attachments of the joints. The pain in the

back is so severe that it is sometimes known as "breakbone" fever. Although the disease is rarely fatal, it is of interest in that there is a good possibility that the disease may some time spread to this country. In spite of the most careful supervision of the aircraft leaving the tropics, it is possible for the infected mosquito to be brought here in this manner. If it should appear, its spread can only be expected during the warm summer months when the conditions are right for the development of the mosquito, *Aedes aegypti*.

As was stated earlier, one cannot expect to become an authority on tropical medicine after one short stay in a tropical area, but many of us feel expert when it comes to the treatment of fungus infections. As one might expect with the heavy rainfall, the dense vegetation, the high humidity, and the intense heat, conditions are ideal for fungus infections of all varieties. Practically all of us had fungus infections of one form or another. On the hands and feet, the fungus appeared much like the usual variety of athlete's foot. It had a similar appearance on the body, and in the auditory canals. Ringworm-like lesions occurred all over the body, and like the fungus infections elsewhere it failed to respond to the usual methods of treatment. It was not unusual to see the infection spread rapidly while the patient was under treatment as a bed patient. Good laboratory studies were out of the question, but pyogenic infection seemed to complicate the picture in most of the severe cases. Out of some rather crude experimentation a combination of sulfathiazole powder and an aqueous solution of mercuriochrome evolved, and this seemed to be effective where other drugs had failed. For convenience, 5 grams of sulfathiazole powder was added to each 100 cc. of a 2 per cent mercuriochrome solution, and this suspension was painted on the lesions without protective dressings. This is by no means a panacea, but should be considered when other solutions and ointments fail.

The suspension of sulfathiazole in mercuriochrome was later used in the treatment of the so-called tropical or coral ulcer. Many ulcerations fall into this classification in the tropics, but the clinical course of a typical tropical ulcer is quite uniform. There is a history of a slight scratch or abrasion, which is followed by prompt healing. This is followed in a few days by swelling beneath the original site of injury, and in a few days the area breaks down into an open sore. It may spread rapidly at first and then remain as an indolent open ulcer that fails to heal under any treatment. Various organisms have been credited as the cause of such lesions, and spirochete with fusiform

bacilli, streptococci, staphylococci, and many other organisms have been recovered. Several typical coral ulcers were treated with mercuriochrome and sulfathiazole with excellent results. None of them failed to heal. Two of these cases had been under treatment for over eight months before they were treated in the above manner. No claims are made for this suspension, but it is offered as a suggestion for further trial.

As a matter of final interest, mention should be made of the disease common in the tropics, namely yaws. It was almost universal among the native population, but as far as is known only one of the white population contracted the disease during our stay. It is caused by the spirochete, *treponema pertenue*, which cannot be distinguished from the spirochete of syphilis. Yaws is not a venereal disease but is transmitted either by direct contact with the open sore of yaws, by contamination from open sores, or by flies that have been in contact with the open sores of yaws. It must be introduced into the body through the open skin, but as the native children run about the island with no clothes on and are in constant contact with the coral and sharp stone, open cuts are frequent. There is an excellent opportunity for the spread of the disease in children, and adults as well. It runs a course very similar to syphilis, the initial granulomatous lesion of yaws (mother yaws), however, usually appearing on the extremities. The secondary eruption usually resembles large warts, but may be smaller papules or scaly ringworm-like lesions. In children, these lesions appear on the feet, and give rise to a peculiar gait, and the children are known to have "crab yaws." In later life, gummatous lesions very similar to syphilis may appear in the untreated cases. Clinical cures are effected by a few treatments with one of the arsphenamine compounds.

In conclusion it must be said that however complicated the tropical diseases may seem, if the possibility of their presence be kept in mind many of them will be easily recognized. It is disturbing to be faced with a clinical picture that is unfamiliar, but fortunately most of the men returning from the tropics are quite well informed of the diseases that are endemic in the areas they have visited. They will probably be the first to help us in the recognition of their disease.

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The Army's malaria fight at present in India Burma is being carried on under the direction of Colonel Karl Rosenius Lundeberg, chief of the preventive medicine section in the theater surgeon's office. A native of Kenyon, Minnesota, Col. Lundeberg was recently awarded the Legion of Merit for his work in preventive medicine in the surgeon general's office. Highly trained malarialogists have worked with the troops and ahead of the troops, in combat, on the Stilwell Road, through the jungles, in and around all types of installations. Theirs has been a major contribution to ultimate total victory. Without them, the Stilwell Road might never have been built and the battle for northern Burma might never have been won.

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May 20, 1945

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W. A. LIEBELER	Grand Forks	Fargo	
F. E. WOLFE	Oakes	Grand Forks	
W. H. LONG	Fargo	Minot	
A. D. McCANNEL	Minot		
R. H. WALDSCHMIDT	Bismarck		
R. W. R. RODGERS	Dickinson		
COMMITTEE ON MATERNAL AND CHILD WELFARE			
J. H. MOORE, Chairman	Grand Forks		
T. L. DEPUY	Jamestown		
P. W. FREISE	Bismarck		
J. D. GRAHAM	Devils Lake		
J. F. HANNA	Fargo		
P. H. WOUTAT	Grand Forks		
E. M. RANSOM	Minot		
M. D. WESTLEY	Cooperstown		
LAWRENCE PRAY	Fargo		
COMMITTEE ON CRIPPLED CHILDREN			
A. R. SORENSEN, Chairman	Minot		
HARRY J. FORTIN	Fargo		
J. C. SWANSON	Fargo		
R. H. WALDSCHMIDT	Bismarck		
W. W. WOOD	Jamestown		
COMMITTEE ON VENEREAL DISEASE			
JOSEPH SORKNESS, Chairman	Jamestown		
H. D. BENWELL	Grand Forks		
NORVEL BRINK	Bismarck		
D. J. HALLIDAY	Kenmare		
T. L. DEPUY	Jamestown		
G. F. CAMPANA	Bismarck		
C. J. MEREDITH	Valley City		
G. W. TOOMEY	Devils Lake		
COMMITTEE ON PNEUMONIA			
O. W. JOHNSON, Chairman	Rugby	Edgeley	
L. H. FREDRICKS	Bismarck	Mandan	
		Williston	
		Valley City	
		Grand Forks	
SPECIAL COMMITTEES			
COMMITTEE ON INDUSTRIAL HEALTH			
C. J. GLASPEL Chairman		Grafton	
W. H. BODENSTAB		Bismarck	
W. A. GERRISH		Jamestown	
COMMITTEE ON WAR PARTICIPATION			
L. W. LARSON, Chairman		Bismarck	
N. O. RAMSTAD		Bismarck	
C. J. GLASPEL		Grafton	
F. W. FERGUSSON		Kulm	
A. R. SORENSEN		Minot	
FRANK I. DARROW		Fargo	
P. G. ARZT		Jamestown	
A. E. SPEAR		Dickinson	
W. A. WRIGHT		Williston	
C. J. MEREDITH		Valley City	
COMMITTEE ON NURSING EDUCATION			
G. W. TOOMEY, Chairman		Devils Lake	
O. A. SEDLAK		Fargo	
R. E. LEIGH		Grand Forks	
WOODROW NELSON		Minot	
N. O. RAMSTAD		Bismarck	
REFERENCE COMMITTEES—House of Delegates			
<i>To consider the Reports of the President, Secretary and Special Committees:</i>			
A. R. SORENSEN, Chairman		Minot	
O. T. BENSON		Glen Ullin	
GUNDER C. CHRISTIANSON		Sharon	
<i>To consider the Reports of the Council, Councillors and Delegate to the A.M.A.:</i>			
G. WILSON HUNTER, Chairman		Fargo	
G. W. TOOMEY		Devils Lake	
C. V. BATEMAN		Wahpeton	
<i>To consider the Reports of Standing Committees, except the Report of the Committee on Medical Economics:</i>			
R. H. WALDSCHMIDT, Chairman		Bismarck	
O. A. SEDLAK		Fargo	
M. J. MOORE		New Rockford	
<i>To consider the Report of the Committee on Medical Economics:</i>			
P. H. WOUTAT, Chairman		Grand Forks	
J. H. FJELDE		Fargo	
D. J. HALLIDAY		Kenmare	
A. P. NACHTWEY		Dickinson	
W. W. WOOD		Jamestown	
COMMITTEE ON RESOLUTIONS			
V. E. FERGUSSON, Chairman		Edgeley	
C. C. SMITH		Mandan	
W. A. WRIGHT		Williston	
COMMITTEE ON CREDENTIALS			
A. W. MACDONALD, Chairman		Valley City	
W. A. LIEBELER		Grand Forks	

Proceedings of the House of Delegates of the NORTH DAKOTA STATE MEDICAL ASSOCIATION

First Session, Sunday, May 20, 1945

The House of Delegates convened in the City Auditorium, Valley City, North Dakota. It was called to order at 9:45 A. M., by the speaker, Dr. John H. Moore. Dr. W. A. Liebeler, acting chairman of the committee on credentials, announced that thirteen elected delegates had presented their credentials, and were qualified. President Wicks appointed Dr. James F. Hanna, Fargo, to serve in the absence of Dr. J. H. Fjelde, delegate from Cass county; and Dr. W. H. Bodenstab, Bismarck, to serve in the absence of Dr. C. C. Smith, delegate

from the Sixth district. The secretary called the roll. Fifteen delegates responded, and the speaker declared a quorum present. Delegates present were: Doctors G. Wilson Hunter, Fargo; O. A. Sedlak, Fargo; James F. Hanna, Fargo; P. H. Woutat, Grand Forks; W. A. Liebeler, Grand Forks; W. A. Wright, Williston; A. R. Sorenson, Minot; D. J. Halliday, Kenmare; C. V. Bateman, Wahpeton; R. H. Waldschmidt, Bismarck; W. H. Bodenstab, Bismarck; O. T. Benson, Glen Ullin; A. P. Nachtwey, Dickinson; W. W. Wood, Jamestown; M. J. Moore, New Rockford.

Introduction of President

The speaker introduced the president, Dr. F. L. Wicks, who presented Mr. Thomas C. Hutchinson, secretary of the Valley City Civic and Commerce association. Mr. Hutchinson extolled Valley City as a commercial, educational and recreational center, and welcomed the delegates to the city. President Wicks then delivered the following address: "It appears that there is in order some remarks from me. I have looked over some of the welcome addresses of the past presidents. They have been traditionally limited to a very few words. I want to give you a greeting and to tell you that you are truly welcome. I want to express my pleasure for the fact that we, as members of the profession, can get together.

"The Sheyenne Valley Medical society is one of the pioneer societies. Valley City has entertained the North Dakota State Medical association three times. The Sheyenne Valley Medical society have had two members who have occupied the office of president. Our society was formed back in December, 1904, as the Barnes-Griggs Medical society. On April 8, 1905, the charter was presented to the society and the name had been changed to the Sheyenne Valley Medical society. This society has been one of service as a component medical society ever since those early days. We have many doctors in our territory but in recent years this membership has decreased. However, we want you to know that even with this small membership, our greeting is none the less cordial and sincere.

"It is really too bad that we cannot have our full assemblage. We need the advice of our members of the association. But you, as delegates, are the elected representatives of our constituents. I am sure that the deliberations and actions here will find support both with your members back home and with us, the officers of the association. This is a time of great concern for our medical association. May I add my greeting and best wishes. I hope that this will be an efficient and harmonious session and when the time comes to think of holding full medical association meetings, we would be glad to see you back in Valley City when we can have the full assemblage. I will now turn the meeting back to your speaker."

Minutes of 1944 Meeting Approved

On motion made by Dr. Waldschmidt, seconded by Dr. Woutat, and carried, the reading of the minutes of the 1944 session, as published and circulated in the August 1944 issue of the JOURNAL-LANCET, were dispensed with and the minutes adopted.

REPORT OF THE SECRETARY

Dr. L. W. Larson, secretary, presented the following report, as printed in the handbook, which was referred to the reference committee on reports of the secretary and special committees.

The total membership for 1944 was 387. Of this number, 318 paid their annual dues, 10 were honorary members, and the dues of 59 members were cancelled because of military service.

Seven of our members died during the past fiscal year, two of whom were honorary members. Ten of those who paid dues in 1943 failed to pay their 1944 dues. Two new members were admitted to the association during the year.

Table No. 1 shows the annual membership for the past six years. The total membership for 1944 is the lowest for this six year period, and is due to the large number of deaths and delinquencies during the year. The revenue of the association from dues is accordingly decreased because the number of members who are in military service, and whose dues are cancelled, has remained stationary.

TABLE NO. 1
Comparison of Annual Membership

	1939	1940	1941	1942	1943	1944
Paid Memberships	394	387	374	366	331	318
Honorary Memberships	3	11	12	10	11	10
Dues Cancelled, military service	—	—	14	32	61	59
Total	397	398	400	408	403	387

Table No. 2 shows that the annual dues for 1945 are being paid quite promptly. To date 294 have paid their current dues.

TABLE NO. 2

	May 5 1941	April 20 1942	May 5 1943	April 20 1944	May 5 1945
Paid-up Members	339	352	316	304	294
Honorary Members	12	10	10	10	9
Dues Cancelled, military service	—	31	58	59	57
	351	393	384	373	360

Field Work. Your secretary must again apologize for his inability to visit all the district societies during the past year. Those he has visited, however, show evidence of interest in scientific medicine and also the problem of medical economics. Some of the smaller societies are relatively inactive, but their members do avail themselves of the opportunity to attend the meetings of nearby larger societies.

Committees. Some of the committees have been unusually active during the past year. This is particularly true of the committees on medical economics and tuberculosis. The report of the committee on medical economics, appearing in the handbook, is the result of a tremendous amount of work on the part of the committee members, especially the chairman, and the association owes them a debt of gratitude.

Medical Economics. The Wagner-Murray-Dingell bill was never brought out from committee, but it has resulted in a great deal of discussion, both pro and con, throughout the nation. Senator Pepper's subcommittee on health has held numerous hearings at which the proponents and opponents of a system of federally controlled medicine have put forth their arguments. The report of this committee indicates a tendency on the part of the committee members, at least, to preserve the private practice of medicine, if possible. The report, however, calls attention to the unequal distribution and availability of medical care and suggests that some method must be developed in the near future which will relieve the situation, and, if possible, be acceptable to the medical profession. In the discussions over the problem of medical care, the spokesmen for organized medicine invariably stress the availability of hospital insurance and prepaid medical insurance plans. For this reason, the problem of prepaid medical insurance is demanding the attention of almost every state medical association in the country. Our house of delegates is confronted with this problem this year, and I hope that they will consider the question very carefully, and not be swayed too much by the pressure of minority groups in this country, nor should they disregard the fact that the public is becoming more and more interested in health matters both preventive and curative.

North Central Medical Conference. This organization, representing the physicians from Minnesota, Wisconsin, Iowa, Nebraska, North and South Dakota, met in St. Paul last December 10th. North Dakota was well represented, those being present being Doctors: Frank Darrow, F. L. Wicks, A. D. McCannel, W. A. Wright, A. E. Spear, and your secretary. The question of post-war planning, and especially prepaid medical insurance plans, were given thorough consideration by the various speakers. I believe this organization should be supported because it is a means by which the problems confronting our profession in these north central states can be freely discussed. Experiences in the various states can be made available to the other states and a common agreement, on matters of policy at least, can be reached.

Full Time Secretary. This is a problem which has been in the minds of many of our members for several years. It is obvious that if our association is to grow and is to accomplish what its members expect of it, the secretary must be able to devote a major part of his time to the job. I doubt that there is a practicing physician in the state who can sacrifice the time which such an effort demands. Our public relations are not what they might be, and a full time secretary could do much to improve them. The major objection to a full time secretary in North Dakota is that our membership is necessarily low, and the revenue from dues limited. An annual budget of at least \$10,000 would be required if a full time secretary were employed. I believe the house of delegates should give serious consideration to this matter, even though it will require a marked increase in our annual dues.

I wish to thank the officers of the state association and the component district medical societies, as well as the members,

for the cooperation they have given and the courtesies they have extended to me during the past year. I wish especially to thank President Wicks for the work he has done during his administration. He has answered his correspondence without delay, and has given much of his time and funds to the affairs of the association. The past year has presented many problems because of the work of the Governor's committee on health planning, and also the legislative session, and President Wicks has been willing to give freely of his time whenever called upon. Those who succeed him as president will have a most difficult time surpassing the record he has set as president of our association.

RECOMMENDATIONS

1. That the association continue its financial support to the North Central Medical conference.
2. That the house of delegates appoint a committee to study the question of a full time secretary for the association and present a report to the next meeting of the house of delegates.

REPORT OF TREASURER

Dr. W. W. Wood, treasurer, presented his report as published in the handbook.

Balance in checking account

April 1, 1944	\$2,743.85
Receipts of dues during year	2,890.00
Interest on bonds received	112.50
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Disbursements:

Checks No. 493 to 510, incl., covering vouchers No. 655 to 673	3,026.50
(Voucher No. 659 spoiled)	
Bank expense	7.15
	<hr/>
	3,033.65
	<hr/>
Check No. 508, covering voucher No. 671, uncashed	2,712.70
	<hr/>
Net balance in bank	2,722.70
Balance in checking account, April 15, 1945.	
Bonds in safety deposit	4,500.00
	<hr/>
	\$7,222.70

REPORT OF THE CHAIRMAN OF THE COUNCIL 1944-1945

Dr. N. O. Ramstad, chairman, presented the following report, which was referred to the reference committee on reports of the council, councillors, and delegate to the American Medical Association.

The Council of the North Dakota state medical association met in Fargo, May 8 and 9, 1944, during the regular session of the association.

Dr. P. G. Arzt resigned as a member of the council and Dr. Joseph Sorkness was elected to fill the vacancy. Dr. C. J. Glaspell of Grafton was chosen to fill the vacancy caused by the resignation of Dr. George Williamson. Many members of the council paid tribute to Dr. Williamson for his long and faithful service as a member of the council.

The financial condition of the association was given careful consideration by the council. With a membership of less than 400 and a membership fee of \$10, we felt that a full-time secretary is not feasible; nor can a more extensive program be carried out by the association with the present limited income. It would seem advisable to consider a higher membership fee, in order that our association can be more active and protect the interests of the members and the public to a higher degree. The following budget was adopted by the council:

North Central Conference	\$ 50.00
Committee on medical economics	100.00
Stenographer for annual meeting	150.00
Emergency fund for chairman of council	50.00
Emergency fund for council	200.00
1945 annual meeting	200.00
A.M.A. delegate	125.00
JOURNAL-LANCET	700.00

Secretary's salary	1,200.00
Postage and office supplies	175.00
Telephone and telegrams	50.00
Travel expense for secretary	150.00
Travel expense for president	50.00
	<hr/>
Total	\$3,200.00

May I call the attention of the house of delegates to the fact that the emergency funds for the council and for the chairman were budgeted so that these sums could be used if emergency needs arose. Dr. L. W. Larson, secretary of the state association, made an extensive report to the council. He reviewed the events of the past year which concerned the medical profession, and stated that in his opinion we could not have a full-time secretary without a budget of about \$8,000.00 per year.

Actions taken by the council authorized Dr. W. A. Wright and Dr. L. W. Larson to represent the association at meetings dealing with postwar planning. Monies allotted to the committee on medical economics are to be used for their travel expenses. The council authorized the payment of a stenographer for the 1944 meeting of \$100 and allowed \$50 extra for travel expenses because of the long distance she had to travel.

It was agreed by the council that in the future the local host society for the state annual meeting be guaranteed up to the sum of \$200 to cover any deficiency in its convention fund. If the deficiency is less than \$200, the society will be paid accordingly.

For the expenses of the delegate to the American Medical Association the council voted not to exceed \$125. The council allowed not to exceed \$700 for subscriptions to the JOURNAL-LANCET. The council authorized the payment of \$1,200 to the secretary for the coming year. A budget not to exceed \$175 was allowed for postage, stationery, and other supplies. The telephone budget was placed at \$150. Expenses as needed by the secretary for visiting societies was not to exceed \$150.

The total amount appropriated at the meeting was \$3,150. The council appointed a JOURNAL-LANCET committee, consisting of Doctors Larson, Long, Benwell, Toomey and Arson, with Dr. L. W. Larson as chairman. This committee is responsible for the publications in the JOURNAL-LANCET. A committee was appointed to edit the transactions of the association in the JOURNAL-LANCET. This committee consists of Doctors Larson, Arson and Ramstad.

The council elected the following officers for the coming year: Dr. N. O. Ramstad, chairman, and Dr. C. J. Glasperl, secretary.

At the request of President F. L. Wicks, a meeting of the council was called at Fargo, January 7, 1945. Present were Doctors F. W. Fergusson, J. C. Fawcett, W. H. Gilsdorf, A. D. McCannel, J. Sorkness, C. J. Meredith, C. J. Glasperl, P. H. Burton, President F. L. Wicks and Secretary L. W. Larson. Also present were Doctors P. G. Arzt, G. F. Campana, G. M. Williamson, Mr. Eagles, W. A. Wright, F. W. Ford, W. H. Long, H. E. French, F. Darrow and J. F. Hanna.

Dr. F. L. Wicks, president of the association, gave a short address in which he reviewed the problems of the doctors of the state and commended the spirit of service which has been rendered by officers and committee members. Dr. L. W. Larson gave a report of the condition of the association.

Dr. G. M. Williamson reported that the board of medical examiners had passed a resolution granting temporary licenses to physicians who may come into the state. He stated that the board had carried out the provisions of the resolution and would continue to do so during the present war emergency.

Dr. W. A. Wright gave a report for the committee on medical economics. The committee has had several meetings and had conferred with Mr. Eagles of the North Dakota Blue Cross plan. The committee had developed a plan to cover surgical and obstetrical services in hospitals only. Dr. Wright recommended that the council approve the introduction of an enabling act in the present legislature. After this is done, plans would be submitted to the district medical societies for their consideration and the instruction of their delegates. The council voted in favor of submitting this enabling act to the legislature.

The report of the committee on tuberculosis was presented by Dr. L. W. Larson and Dr. G. F. Campana, state health

officer. This plan has been outlined to every member of the association by the secretary and the council approved and adopted the report of the committee unanimously. The council supported an amendment to the North Dakota state uniform drug act, which will place demerol on the list of narcotic drugs.

Dean French of the state university discussed the question of expansion of the medical school to a four-year course. A committee was appointed to consider Dean French's report, and the council accepted their report to the effect that the members of the North Dakota state medical association are interested in any movement which will improve the medical care of the people. It believes that improvement of the present two-year medical school be encouraged and steps taken to study the feasibility of changing the medical school to a full four-year course.

The council considered the request from the nursing profession to obtain registration controlling practical nurses. The council felt that this was not a propitious time for restrictive legislation, bearing in mind the probable draft of nurses in the near future.

The council agreed that the committee on public policy and legislation be empowered to handle all legislative activities. The council voted to appropriate an additional \$200 for the expenses of the committee on medical economics.

The council voted that in view of travel restrictions and the war, the question of holding a state convention during 1945 be left with the committee on scientific program.

The meeting adjourned.

Respectfully submitted,

N. O. RAMSTAD, M.D.,
Chairman of the Council.

REPORTS OF THE COUNCILLORS

The following reports of the councillors, as published in the handbook, were referred to the reference committee on reports of the council, councillors, and delegate to the American Medical Association.

First District

The following is a resume of the proceedings of the Cass County medical society for the year 1944, as submitted by Dr. Charles Heilman, secretary.

"The Cass County medical society held eight regular meetings during 1944. In addition, we were hosts for the annual session of the North Dakota state medical association, held in Fargo in May, 1944.

"The meetings were held, as has been our custom, at monthly intervals, except during the summer months. These meetings invariably consist of a good dinner, a short business meeting and a scientific program or special speaker talking on medical economics, or some subject of importance and general interest to our members. During 1944 some excellent scientific programs were presented by Dr. J. M. Adams, Dr. Walter A. Carley and Dr. O. H. Wangensteen of the University of Minnesota. At one meeting Mr. Donald Eagles discussed 'Trends in Prepaid Medical and Hospital Care.' At another meeting we enjoyed a movie on 'Malaria and Mosquito Control.' The discussions and interest created in this subject were no doubt responsible for the initiation of a definite mosquito control program in the Fargo area for the present season. At two of the meetings, a scientific program was provided by local talent, that is, by members of the local county society who made very satisfactory presentations.

"Early in December the Cass County society was host to our neighbor societies in Minnesota; the Clay-Becker, Park Region and Red River Valley societies. Owen H. Wangensteen was guest speaker. Nearly one hundred physicians were present at this meeting.

"A complete report of the annual session of the state medical association has been forwarded to Dr. L. W. Larson, our secretary, in which the organization, statistics and criticism, with recommendations for improving these state meetings in the future, were made.

"Our roster for 1944 listed 64 physicians as members of the society, including 14 who were in the armed forces."

The secretary of the Richland County medical society informs me that no meetings have been held during the past year. The officers are the same as they were last year.

PAUL BURTON, M.D., Councillor.

Second District

The Devils Lake District medical society completed a relatively quiet year. The society had a meeting every two months during the year. The programs consisted of routine business, usually case reports, and discussion of medical economics. An attempt was made to have outside speakers for most meetings, but the speakers were confined to those residing within the state because of the pressure during the war. The attendance of the meetings increased somewhat over 1943, and I believe considerably more interest was shown (this probably due to a large extent to the economic situation).

This district had 21 active members during 1944, plus 5 members serving with the armed forces, one honorary member-ship, and 5 physicians not interested in membership. There was no loss in membership during the year due to death or transfer elsewhere.

JOHN C. FAWCETT, M.D., Councillor.

Third District

The Grand Forks District medical society has completed a satisfactory year under the guidance of the following officers, elected at the December meeting:

President, Dr. C. R. Tompkins, Grafton; vice president, Dr. Ralph Leigh, Grand Forks; secretary, Dr. A. F. Jenson, Grand Forks; treasurer, Dr. W. C. Dailey, Grand Forks; delegates to state convention, Drs. P. H. Woutat and W. A. Liebler, Grand Forks; alternate, Dr. G. M. Williamson, Grand Forks.

We have 50 members in our society and, in addition, the following members are in the armed forces: Drs. Silverman, Brown, Canterbury, Griffin, Mahowald and Ransom, all of Grand Forks.

We have five honorary members, namely: Dr. F. N. Burrows, Bathgate; Dr. J. E. Countryman, Arch Cape, Oregon; Dr. G. W. Glaspel, Grafton; Dr. A. B. Field, Forest River; Dr. W. H. Welch, Larimore.

There is only one physician in the district who is not a member of the society.

Last year, there were six regular meetings held, with the average attendance of 18 members, and three special meetings with an average of 24. The April meeting was devoted entirely to the discussion of the many economic problems which confront our profession at this time. The September meeting was held in Grafton, as is the custom, with Dr. G. W. Hunter of Fargo, speaking on obstetrical problems.

There were three deaths during the year: Dr. H. M. Wal-dren, Sr., Drayton; Dr. O. H. Rystad, Grand Forks; Dr. E. C. Haagenson, Grand Forks.

C. J. GLASPEL, M.D., Councillor.

Fourth District

The Northwest District medical society has had a very good year. We have held nine meetings during 1944 with an average attendance of 16. We now have 52 members in good standing with 10 men in the armed services.

During the year we have had some outstanding programs. Out-of-town speakers included Dr. J. K. Anderson of Minneapolis who gave a splendid talk on office proctology; Dr. A. K. Hayne, professor of contagious diseases of the University of Illinois gave an especially good talk and conducted a round table discussion on contagious diseases, which discussion was entered into enthusiastically by members present. Dr. Clarence Dennis, associate professor of surgery of the University of Minnesota, discussed ulcerative colitis and Melvin Koons of the state public health laboratory of Grand Forks discussed the blood plasma program in North Dakota. He gave us information as to the equipment and services that we now have in the state handling this program.

At several of the meetings educational films were shown which added considerably to the interest of the meetings.

Our meetings have been held this year, as they have in the past, alternatively between Trinity and St. Joseph's hospitals.

Drs. Cameron, Rowe and Breslich gave a very interesting discussion on gastric ulcer, diagnosis and treatment, and the results of operative procedures on several interesting cases.

The society passed a resolution adopting the fee schedule of the Public Welfare board to cover the cases handled by the Red Cross, in taking care of dependents of men in the armed forces. This has clarified the work of the Red Cross and has worked out very satisfactorily.

The Kotana society reports that they have had no special activities this year but for one annual meeting, the rest of the time combining their activities with the hospital staff meetings.

Officers elected to serve for 1945 are: Dr. G. Harmon Brunner, president, Minot; Dr. A. F. Hammargren, vice president, Harvey; Dr. Woodrow Nelson, secretary, Minot.

ARCHIE D. MCCANDEL, M.D., Councillor.

Fifth District

Herewith is the report of the Fifth District medical society for the year 1944.

Our society now has a membership of ten, five less than in 1941. We have lost one member, Dr. C. A. Platou, by death. Of the ten members, seven practice in Valley City, two in Cooperstown, and one in Nome; and of the seven in Valley City, two are limited to eye, ear, nose and throat specialties and five are in general practice. Two of the latter five are limited in their activities by age.

Two meetings were held during the year. Because of our small membership and distance to be traveled by three of our men, no scientific programs were planned, but some of our members attend scientific meetings of neighboring societies, and our members in Valley City have an opportunity for clinical discussions at the monthly hospital staff meetings. Two of our members are serving in the U. S. Army medical corps.

Officers of the society for 1945 are as follows: President, J. Van Houten; vice president, M. D. Wesley; secretary-treasurer, C. J. Meredith; delegate, A. W. Macdonald; alternate, C. J. Meredith.

Excellent harmony and cooperation prevails in the society.

C. J. MEREDITH, M.D., Councillor.

Sixth District

During the past year the Sixth District medical society has had a successful year. The attendance at the meetings has been good and discussions of medical and economic problems have been interesting and helpful. The program committees have functioned well and the papers presented have been well prepared and of universal interest. The following papers have been presented:

1. Management of Diabetes Mellitus—Dr. A. C. Grorud.
2. Plasma Program in North Dakota—Dr. F. J. Hill.
3. Changing Fashions in Immunization Procedures—Dr. Harry Wheeler.
4. Symposium on Penicillin—Drs. L. H. Fredricks, P. L. Owens, L. W. Larson.
5. Restaurant Sanitation in Bismarck and the Ice-cream Ordinance—Dr. P. L. Owens.
6. Private Water Supply Testing—Dr. K. Lauster, state sanitary engineer.
7. Comments on Medical Problems in North Dakota—Dr. M. S. Jacobson.
8. Symposium on Abnormal Uterine Bleeding—Drs. P. L. Owens, L. B. Moyer, A. M. Brandt.
9. Plastic Surgery—Dr. B. Lannin, Minneapolis, Minn.

Our present membership is 66, eight of these are in United States services. One new member has been admitted: Dr. George Campana, our state health officer.

The present officers are: President, Dr. P. W. Freise; vice president, Dr. F. F. Vonnegut; secretary and treasurer, Dr. W. B. Pierce; censors, Drs. G. R. Lipp, W. H. Bodenstab and F. B. Strauss; delegates, Drs. R. H. Waldschmidt, O. T. Benson and C. C. Smith.

Throughout the year good fellowship has prevailed and there has been no dissension.

N. O. RAMSTAD, M.D., Councillor.

Seventh District

Two meetings of the local medical society were held this year, one on October 4, 1944, and one on March 8, 1945. At the October meeting, business matters and support of the state public health plasma program were taken up. At the March meeting, a scientific film on nutrition was shown, as well as election of officers for the ensuing year. A third meeting to consider the North Dakota physician's service is scheduled for April 26th.

At present there are 18 members of the society with dues paid for 1945.

JOSEPH SORKNESS, M.D., Councillor.

Eighth District

The Southern District medical society held two meetings during the year, the first at Ellendale on October 19, 1944. The speakers were Dr. Geo. Campana, state health officer, and Mr. Melvin Koons, from the state university. The second meeting was held at LaMoure, November 30, 1944. The speaker was Dr. Francis C. Lawler, bacteriologist at the state university, his topic being Malaria. He showed numerous slides presenting the different stages in the development of the organism.

Dr. Robert K. Dodd of Lisbon and Dr. Ivan Linsen of LaMoure were admitted to membership during the year. The total membership in the society is eight.

The officers are: President, Dr. F. E. Wolfe; secretary-treasurer, Dr. H. J. Meunier; delegate to the state meeting, Dr. V. D. Ferguson, and alternate, Dr. Roy Lynde.

F. M. FERGUSON, M.D., Councillor.

Tenth District

The Southwestern District medical society held four meetings during the last year. Each meeting was well attended and was enjoyed by all present.

We have nineteen active members and two members in the armed forces which gives us a total membership of twenty-one.

W. H. GILSDORF, M.D., Councillor.

REPORTS OF STANDING COMMITTEES

The following reports of standing committees were referred to the reference committee on reports of standing committees.

Medical Education

Your committee on medical education would call attention to its reports of last year and of earlier years to indicate the plan, scope, needs, etc., of the school of medicine of the University of North Dakota. Since the meeting of last year, the school has remained in almost continuous session, the accelerated program demanded by the national emergency. Classes have remained of the same size, but admissions come approximately every nine months; work and transferring have gone on as usual.

As newer items, we can report that the state legislative session of 1945 made an appropriation for the school that is in almost exactly the same terms as that of 1943, and consequently scarcely adequate; it also took two steps that are encouraging for the school, senate Bill 115 and an appropriation for a science building. By senate Bill 115, it recognizes the medical school as to be thought of as a unit about which a possible future medical center is to be built; it authorizes the school to accept possible benefactions from private sources, or the government; and it creates a medical center advisory committee. The medical council advisory committee is authorized to make a survey of the efforts and the needs of the state in the way of hospitalization and medical care, the provisions for the insane, the tubercular, crippled children, and indigent patients of any kind, and to determine whether it will be possible to work out a plan that will also make possible the expansion of the school to include clinical teaching.

H. E. FRENCH, M.D., Chairman.

Necrology and Medical History

1945

In accordance with the traditions of our profession, we pause in the midst of the affairs of life to pay our devout respect to those of our colleagues who have left our ranks, since last we met. To those bereaved we extend our sincerest sympathy. Their loss is, in a large measure, also our loss. The place of companion, friend and co-worker is never completely filled. May grief of the hour be mercifully lessened with the passage of time. May each find satisfaction in the heritage of a life spent in glorious service to mankind.

J. W. CAMPBELL

Dr. John William Campbell, 75, passed away April 13, 1944, in Fargo, where he had resided for many years. He was a native of Hanover, Canada. Dr. Campbell was a graduate of Rush Medical college, class of 1897, and was licensed to practice in North Dakota in January 1898. In practice Dr. Campbell paid particular attention to diseases of the eye, ear, nose and throat. Besides his Fargo location, he had practiced at other points of the state, including Valley City and Larimore. Survivors, besides Mrs. Campbell, are two sisters, Miss Belle Camp-

bell of Walhalla, N. D., and Mrs. Delbert McQuin of Harlowton, Montana.

CARL ANTON PLATOU

Dr. Carl Anton Platou, 57, died in Pompano, Florida, May 22, 1944. He had spent the past winter in the south in hopes of recovering from an heart ailment. He was anticipating an early return to practice in his home at Valley City, when he was stricken. Dr. Platou was a native of Staten Island, New York. After preliminary education at the Thomas Heffery preparatory school, he attended Johns Hopkins medical school and graduated from the Maryland Medical college in 1912. He was licensed in North Dakota in 1916. His internship was served at the Buswick hospital in Brooklyn. During World War 1 he was a captain in the medical corps. He was past commander of the American Legion; a member of the 40 and 8; and a past worshipful master of the Masonic blue lodge. Dr. Platou was first located at Litchville, N. D., serving that community from 1914 to 1929 and since, practicing in Valley City. Survivors are Mrs. Platou, a daughter, Carolyn Ann; four sisters and three brothers, including Col. Pedro Platou of the M.C.A.U.S.

CLARENCE W. ROBERTSON

Dr. Clarence W. Robertson, 53, passed away May 22, 1944, at Jamestown, in which location he had practiced for the past eight years. He had previously been a member of the Northwest clinic at Minot. He was the victim of a coronary attack. Dr. Robertson was a native of Forest River, N. D. He graduated from the state university in 1911 and from Rush Medical college, class of 1915. He was registered in North Dakota in 1920. Dr. Robertson interned at Cook County with special training in eye, ear, nose and throat work. He practiced this specialty as a member of the DePuy-Sorkness clinic. Dr. Robertson was a veteran of World War 1, serving as a captain in the medical corps. He was a member of the American Legion, the Elks, and El Zagal Temple of the Mystic Shrine. At the time of his death he held the office of vice president in the North Dakota academy of ophthalmology and otolaryngology. Survivors are Mrs. Robertson; his parents, Mr. and Mrs. J. D. Robertson of Park River; a sister and a brother.

HUGO NEUKAMP

Dr. Hugo Neukamp, 68, died at Hosmer, S. D., June 1, 1944, as a result of an automobile accident. Dr. Neukamp was a native of Soest, Germany, and pursued his medical education at the University of Bonn, from which he was graduated with highest honors in 1899. He was licensed in North Dakota October 23, 1902. Coming to the United States in 1900, he practiced his profession in New York City for a short period of time. In 1901 he located in Fessenden, N. D., and practiced also at McClusky, Beulah and Strasburg before going to South Dakota to locate at Hosmer in 1930. Dr. Neukamp was a Mason and belonged to state and national medical associations. He is survived by his daughter, Mrs. Alice Craig of Phoenix, Arizona, and a son, Frank H. Neukamp, Major M.C.A.U.S.

LLOYD B. DOCHTERMAN

Dr. Lloyd B. Dochterman, 66, died June 6, 1944, at Williston, where he had practiced for forty years. His death was caused by a retroperitoneal hemorrhage. He was born in Covington, Ind., and was left an orphan when four years of age. By hard work he earned his way through college, graduating first in pharmacy at Valparaiso university, and later received his degree in medicine from the Detroit Medical college in 1900. He came to North Dakota to locate at Bottineau and was licensed to practice on July 12, 1900. Dr. Dochterman later, in 1904, moved to Williston where he spent his career in the profession with the exception of his military service as a captain in the medical corps of World War 1. Dr. Dochterman knew the hardships of pioneer practice, and on his sixtieth birthday was honored by more than 1000 of those whom he had brought into the world. He was civic-minded, serving on the city commission, the library board, and for many years as health officer of the city. He was a staff member of both Mercy and Good Samaritan hospitals. Dr. Dochterman was a member of the Elks, the American Legion, and the 40 and 8. He was a member of the Christian Church. He is survived by Mrs. Dochterman, a daughter, Lois, and two sons, Donald and

Lt. Lloyd D. Dochterman, M.C.A.U.S. His body was returned to his birthplace for burial.

PIERRE ULRIC LABERGE

Dr. Pierre Ulric LaBerge, 83, died at his home city, Ambrose, July 4, 1944. He was a native of Montreal and graduated in medicine from Victoria university, Montreal, Quebec, class of 1886. He was licensed in Dakota Territory February 1, 1887. Dr. LaBerge came to the state at the age of 26, and engaged in practice first in the Grafton area. He also practiced at Williston, Crosby, Fortuna and Westby.

JACQUES VOORHES QUICK

Dr. Jacques Voorhes Quick, 82, died July 16, 1944, in a Fargo hospital. He had been in ill health for several months. Dr. Quick had been a resident of Wahpeton and a practitioner there for more than 55 years, with the exception of a year and a half, which time was spent in Alaska in 1898-9. In point of length of service, he was one of the oldest of our profession, only ceasing practice at the advent of his last illness. Dr. Quick was born in New Jersey and graduated first from the Philadelphia College of Pharmacy and then the Jefferson Medical college in 1886. He was licensed to practice in Dakota Territory May 2, 1887. He came to Wahpeton in 1888. Mrs. Quick died in 1940. He is survived by two daughters and a brother, H. B. Quick, of Fargo.

JOHN SAMUEL WHITSON

Dr. John Samuel Whitson, 76, passed away at Enderlin August 6, 1944. Dr. Whitson retired from practice two years ago because of ill health. He was a native of Indiana and graduated from Rush Medical college, class of 1892. He was licensed January 7, 1916. Dr. Whitson had been a resident in North Dakota since 1912. He was a member of the Baptist church and Masonic bodies, including the Shrine. Mrs. Whitson died February 6, 1944. Survivors are a daughter, a step-daughter and three grandchildren.

OLAF H. RYSTAD

Dr. Olaf H. Rystad, 68, of Grand Forks, died August 17, 1944, while on a vacation at Lake Plantagenet, Minn. Dr. Rystad was born in Norway and came as a small boy with his parents to live at Fisher, Minn. He was graduated from the Chicago college of medicine and surgery, class of 1913, and was licensed in North Dakota January 19, 1944. He first practiced at Landa, N. D., but removed to Grand Forks in 1921 at which point he continued his work until he was called from his labors. Survivors are his wife and one daughter, Mrs. Hans Lie, a resident of California.

CHARLES MACLACHLAN

Dr. Charles MacLachlan, 83, passed away in his home city of New Rockford on October 14, 1944. He had been in ill health for a number of months, his death being caused by complications of bronchial pneumonia. Dr. MacLachlan was a native of Ontario, Canada. He received his early education at Erie and graduated from the Canada business college in 1880. He first came to Dakota Territory in 1883, filing on a piece of land south of the present town of Brinsmade. After proving up on his claim in 1884, he decided to study medicine, so entered the medical department of the University of Toronto from which he was graduated in 1889. Soon after his graduation, he returned to New Rockford to commence his career as a practitioner of medicine. He was registered June 17, 1889. Dr. MacLachlan knew full well the life of the pioneer physician. He was a man of courage, self-reliance, integrity and great versatility. Many honors came to him during his long years in the profession. He bore them all with becoming grace. He balanced every equation by the giving of efficient service. Dr. MacLachlan was a member of the first state board of medical examiners; served as surgeon for the Northern Pacific and Great Northern railways; as a legislator; was appointed surgeon general of the national guard, serving from 1895 to 1911 with the rank of colonel; was president of the state medical association in 1909. He served two terms as president of the state board of health; two years as a trustee for the state hospital at Jamestown; for a number of years was a member of the game and fish commission and served as head of the state tuberculosis hospital at San Haven, retiring in 1937 after eight years with the institution. Dr. MacLachlan was a past president of the International Peace garden association which he helped to

organize and which held his interest to his final days. He was a member of the Masonic bodies of Fargo and a life member of the Scottish Rite and the Order of the Mystic Shrine. In younger days, he was active as an organizer and member of the Yeomen, Odd Fellows and Workman lodges. Survivors are Mrs. MacLachlan and three daughters, Mrs. O. J. Campbell and Mrs. Marjorie Dale, both of Minneapolis, Mrs. J. S. Williams of St. Paul, and seven grandchildren.

WILLIAM H. PORTER

Dr. William H. Porter, 71, died October 15, 1944, in a Devils Lake hospital where he had been a patient for several months. Dr. Porter practiced his profession in North Dakota for 41 years, being located first at Olga for two years and the remainder of his years of service at Calvin. He was born April 20, 1873, at Hillsburg, Ontario, and came to the United States in 1886. He received his early education in the schools of Cavalier county and his college education at the Mayville normal school. Dr. Porter was graduated in medicine from the University of Illinois, class of 1903. He was licensed in North Dakota October 15 of the same year. Dr. Porter was a prominent civic and political leader, he was a state senator from 1918 through 1933, and again held that office by reason of his election in 1943. He was a Democrat. Because of his prominence in politics, he was one of the four known as the "Four Horsemen." Much of his interest and influence was along public health lines. He held the chairmanship of the senate committee on public health for many years. Dr. Porter was a member of the staff of Mercy hospital, Langdon; head of the Calvin school board; president of the county school officers' association; a member of the Masonic blue lodge and Eastern Star of Calvin; the Scottish Rite bodies of Langdon and Kem Temple of the Mystic Shrine, at Grand Forks. Survivors are Mrs. Porter; a son, William H. Porter, Jr.; a grandson, William H. Porter, III; a brother, Dr. C. A. Porter, dentist, of Fargo; two other brothers, including Edward E., of Calvin; a sister, Mrs. D. F. McDonald, of Fargo, and three other sisters living in the west.

JAMES M. GIBBONS

Dr. James M. Gibbons, 62, retired physician of Bismarck, died November 24, 1944. Dr. Gibbons graduated from Northwestern, class of 1908, and was licensed to practice in North Dakota in October of the same year. He had practiced at Almont, Finley and Bismarck, giving special attention to eye, ear, nose and throat work. Dr. Gibbons is survived by Mrs. Gibbons and a brother, G. G. Gibbons of Spokane, Wash. Burial was made at St. Mary's cemetery at Bismarck.

THOMAS PETER ROTHNEM

Dr. Thomas Peter Rothnem, 61, died January 19, 1945, at his home in Fargo. He had retired from practice after having suffered a stroke two years ago. Dr. Rothnem was a native of Oslo, Norway, and came with his parents to America when eight years of age. He received his education in the schools of Minnesota, attending St. Olaf college, Northfield, and was graduated from the medical department of the University of Minnesota with the class of 1912. He was licensed to practice in North Dakota January 10, 1919. Dr. Rothnem was in general practice at Wendell, Minn., until 1917, when he took post-graduate work and then specialized in roentgenology, coming to Fargo in 1918, where he was associated with the Fargo Clinic. For many years he was a director of this group. He held membership in several national societies of radiology and was author of numerous papers pertaining to his work. Dr. Rothnem was a member of the First Lutheran church of Fargo. He is survived by Mrs. Rothnem, a daughter Charlotte, in training at the Swedish hospital in Minneapolis; a son, Lt. Morris Rothnem, of the Army medical corps at Camp Atterbury, Indiana; three brothers, three sisters and one grandchild.

STANLEY EARL PATTERSON

Dr. Stanley Earl Patterson, 43, died in the Mandan hospital, Mandan, N. D., February 6, 1945, after a long illness. Death was caused by a liver ailment and complications. Dr. Patterson was a native of Roland, Manitoba, Canada, where he received his early education. He graduated from the University of Manitoba with the class of 1928. He was licensed to practice in North Dakota January 9, 1931. Dr. Patterson interned at St. Boniface hospital, Winnipeg, and the Shriners' hospital in the same city. He practiced first at Oak Lake, Manitoba, in

1928, coming later to North Dakota to locate at Rhame in 1931. In 1937 he moved to Mandan and remained there to the end of his life. Dr. Patterson was a member of the Presbyterian church, the Masonic lodge, the Elks lodge and the Lions club. He is survived by Mrs. Patterson; two children; three brothers and two sisters. The body of Dr. Patterson was returned to his birthplace for burial.

FRED C. SOPER

Dr. Fred C. Soper, 63, died in a Fargo hospital February, 1945, as a result of pneumonia. Dr. Soper was a native of Stanwood, Iowa. He graduated from Cornell college and studied medicine and graduated at the University of Iowa, with the class of 1905. He was licensed to practice in North Dakota July 6, 1906. He started his medical career as a practitioner at Leonard and afterwards was located at Medina and Erie, all in North Dakota. For many years he had practiced at Dilworth, Minn., and since 1938 held the office of coroner of Clay county. He was surgeon for the Northern Pacific beneficial association. Dr. Soper was a member of the Masonic order and the Advance lodge of the Odd Fellows. He was a member of the Presbyterian church. Besides Mrs. Soper, he leaves three daughters and a sister. Burial was made in the Riverside cemetery, Moorhead, Minn.

DARIE LEMIEUX

Dr. Darie Lemieux, 70, of Rolla, N. D., died March 26, 1945, in a Bottineau hospital. Dr. Lemieux was a native of Quebec, Canada, and graduated from Laval university. He was licensed to practice in North Dakota April 12, 1900. He had been a practitioner of the state for 46 years, about half of which time he was a resident of Rolette county, where for a number of years he held the office of county health officer. Dr. Lemieux first entered practice at Fargo and had also practiced at Dunseith, Leeds, New England and Stanley before locating at Rolla. He was civic minded and held many positions of trust and responsibility. He was a member of the house of representatives at the 1905 session; served four years as mayor of Dunseith; was a member and the first secretary of the board of trustees of the state tuberculosis sanatorium and held the office of colonel on the staff of Governor L. B. Hanna. Dr. Lemieux had studied in France in 1908-9 and during World War I was an acting assistant surgeon in the U. S. public health service. Dr. Lemieux was a member of the Knights of Columbus and the Elks lodge. Survivors include Mrs. Lemieux and three children, one being Lt. Corinne H., now serving in France with the Army nurse corps.

EDWARD CORNELIUS HAAGENSEN

Dr. Edward Cornelius Haagensen, 75, died March 28, 1945, in a hospital in his home city of Grand Forks. His death occurred as a result of a heart attack suffered one week earlier. Dr. Haagensen was born in Cambridge, Wis., removing with his parents at an early age to Evanston, Ill., where his preliminary education was acquired. He was graduated from the Chicago Medical college with the class of 1894 and was licensed to practice in North Dakota July 17, of the same year. In starting his medical career, Dr. Haagensen chose Hillsboro, N. D., where he practiced his profession for twenty-five years. At the end of this period of service he removed to Grand Forks, where he had since resided. He was city health officer of Grand Forks at the time of his death. Dr. Haagensen was a member of local, state and national medical bodies, and his lodge affiliations included membership in the Scottish Rite and Kem Temple of the Mystic Shrine, and the Fraternal Order of Eagles. In the passing of Dr. Haagensen, his home city has lost one of its prominent and valuable citizens; his profession one of its real and reliable pioneers. Surviving Dr. Haagensen are Mrs. Haagensen, the former Henrietta Paulson of Hillsboro, and seven children, including Dr. Cushman D. Haagensen of New York City and Lt. Darrell Haagensen of Washington, D. C. Surviving also are two sisters.

G. M. WILLIAMSON, M.D., F. L. WICKS, M.D.,
Co-Chairmen.

Public Policy and Legislation

The following is a report of the committee on public policy and legislation:

Our committee first met on January 7, 1945, in Fargo at the same time the board of medical examiners and council were meeting.

The entire group discussed the program of legislation, especially in regard to endeavoring to pass an enabling act for a prepaid medical insurance program at the next legislature. This act was proposed by the economic committee and was practically the same as the plans in the states of Michigan, Minnesota, and others, where passage has made possible this type of prepaid medical insurance.

Plans were made to have the enabling act introduced at the state legislature in 1945, and considerable assistance was given in the senate by Dr. E. C. Stucke of Garrison and Dr. G. F. Drew of Devils Lake. Dr. F. L. Wicks and Dr. L. W. Larson appeared before the committee and we are glad to report that the enabling act was passed in the senate by a vote of 44 to 3, and in the house by a vote of 75 to 8. It carried the emergency clause, and became a law when the governor signed the bill on February 28.

This was the only matter that came before the legislative committee this year.

ARCHIE D. MCCANNEL, M.D., *Chairman.*

Tuberculosis

Permit me to report that the committee on tuberculosis has conferred with the state health officer and Miss Katen, secretary of the North Dakota anti-tuberculosis society, and formulated plans for cooperation in a screening program for tuberculosis to be carried out with a mobile unit under the auspices of the state health department and the state tuberculosis committee.

Before we undertook this activity, we canvassed the medical profession in North Dakota and they voted overwhelmingly in favor of the project.

The unit will probably be put in operation this summer and Dr. Campana has informed me recently that a staff is complete, including a physician to read the films, so that burden will not fall upon the roentgenologists of the state.

When suspect cases are found, they will be referred to the medical profession for study and treatment. The first project will be the screening of high schools and institutions of higher learning, and the program will be expanded as rapidly as the facilities are available.

J. O. ARNSEN, M.D., *Chairman.*

Official Publication

The relationship with the manager and editor of the JOURNAL-LANCET during the past year has been satisfactory. All material submitted to the JOURNAL-LANCET has been published without question. Appeals from the editor have been received from time to time for more material concerning our association, which indicates the desire of the JOURNAL-LANCET management to be of service to the association. The quality of the papers presented in the JOURNAL-LANCET has remained high, in spite of the shortage of available manuscripts because of the war.

L. W. LARSON, M.D., *Chairman.*

Cancer

As this report is being written, the first nation-wide, concerted effort to raise five million dollars to conquer cancer is being made by the American Cancer Society. The reports received to date by the North Dakota Division of the Field Army indicate a wide-spread interest in the problem of cancer by the citizens of North Dakota. Informative literature, stressing the need for periodic physical examinations by the family physician and the importance of knowing and recognizing the danger signals which may mean cancer, is reaching thousands of our citizens as a result of this campaign. Obviously, the physician will be consulted with increasing frequency by people who do not have cancer. The family physician, who is usually consulted first, will be confronted with the opportunity for the discovery of early malignant lesions, or the ruling out of cancer by the discovery of some other explanation for the patient's symptoms. This gives the physician an opportunity to practice practical preventive medicine, and to demonstrate his ability to assume responsibility for the physical well-being of his patients. With this opportunity, however, goes a grave responsibility. The physician must give such a patient a sympathetic hearing, a thorough physical examination, and the benefit of consultation when needed. To do less will serve only to undermine the confidence of the public in our profession. Lay people are contributing freely of their time and money to conquer

cancer, that dread disease which is the second cause of death in the United States and kills 165,000 Americans every year. The campaign of the American Cancer Society to raise funds for its program of education, research, and service to cancer patients, deserves the wholehearted support of the medical profession.

Thirty-six North Dakota physicians attended the special course in cancer at the continuation center, University of Minnesota, during the first four days in February of this year. This course was sponsored by the executive committee of the North Dakota division of the field army, of which the members of your committee on cancer are members. The expenses of the North Dakota physicians attending the course were paid from a fund into which the field army and the state health department contributed equal amounts. The course was arranged by Dr. W. A. O'Brien, director of postgraduate medical education at the University of Minnesota, and was designed to be of particular interest and value to the general practitioner. The enthusiasm with which it was received by those fortunate enough to attend, indicates the excellent job done by Dr. O'Brien and the faculty of the University of Minnesota. It is the hope of the field army that similar courses can be arranged in the future, so that every general practitioner in the state may have an opportunity to learn the important facts about the diagnosis and treatment of cancer, especially in its early stage.

L. W. LARSON, M.D., *Chairman.*

Fractures

No meeting of the fracture committee was held during the year of 1944. However, during the summer of 1944, there were communications from Dr. Charles Scudder of Boston in regard to the fracture work in North Dakota. His suggestions have been carried out wherever possible.

R. H. WALDSCHMIDT, M.D., *Chairman.*

REPORT OF COMMITTEE ON MEDICAL ECONOMICS

For several years past the committee on medical economics has been charged by the house of delegates with the task of studying prepayment programs or, as they have lately come to be called, medical service plans. This has been done, and each year the committee has reported their conclusions to the house of delegates. Invariably the report concluded that the time was not yet ripe for us, in North Dakota, to set up a medical service plan.

In 1944, a resolution from Cass county urging the association to sponsor a medical service plan was referred to the economics committee by the house of delegates. Apparently then a substantial number of our members felt that the time had arrived for us to embark on such a venture.

You are all aware of the fact that the private practice of medicine on a fee for service basis has been under attack for many years and that various people in and out of the profession, and in and out of the government have suggested many changes. Such changes range all the way from straight federalization of medical care to expansion of prepayment facilities.

In North Dakota during the past year there has been agitation mainly by certain farm groups for a marked change in the system of private medical practice. Without going into detail, it may be stated that one group is working towards a program leading to the public health authorities taking over certain functions of the practicing physician. The other group is trying to establish complete control over medical practice by setting up groups of doctors, who will work for them on a salary basis. Many of us now feel that a purely negative attitude toward these problems is not the proper approach. It is our feeling that they must be met by a positive approach in which we can offer a sound program leading to a better and more equitable distribution of medical care.

We do not wish to abandon such tried and true principles of medical practice as free choice of physician, personal physician patient relationship, nonintervention of a third party and financial responsibility of the individual to his doctor. However, if there is a way in which we can help people meet the cost of illness in a more satisfactory manner, without sacrificing any of the basic principles to which we adhere, it seems that it would be to our advantage to follow this way. A medically

sponsored non-profit prepayment plan offers such a way. A large amount of experience in this type of medical service is now available to us following pioneer work done in Michigan and California. We can also benefit from the experience of hospital service associations. At the present time medical service plans of some sort are operated, or in the process of being put into operation in 38 states, as well as in many counties, cities and districts.

Experience elsewhere teaches us that:

1. Comprehensive complete medical care programs cannot be offered at the present time because either the premium is so high that people will not buy it or the service demands are so great that losses quickly appear.

2. There is a demand for surgical and obstetric benefit programs.

3. It is possible to provide such policies providing for some of the more expensive types of care at a premium well within the ability to pay of large numbers of people.

4. Many such people are now subscribers to hospital service associations.

5. It has been found expedient for medical service plans and hospital plans to work together, especially in the matter of selling and collections.

Several meetings of the economic committee were held during the past year and it was decided that a tentative plan be drawn up and submitted to the house of delegates at the 1945 annual session. The first step in the inauguration of such a plan is the passage of an enabling act in the state legislature. Such an act was drawn, approved by the council of the association and passed at the last legislative session as House Bill No. 187. This act sets out the condition under which non-profit medical care corporations may be set up and operated in North Dakota subsequent to its passage. The act provides that a majority of the board of directors of any such corporation shall be licensed doctors of medicine. Other parts of the act have to do with the relations of such corporation to the insurance department, non-profit nature, tax exemption and other pertinent provisions.

In preparing a medical service plan for consideration by the house of delegates this committee has studied a great deal of material, much of it of a conflicting nature. We are fortunate in that we have available experience gained in other states, notably in Michigan and California, as well as hospital associations. During this time we have received most valuable assistance and counsel from Mr. Don Eagles, executive director of the North Dakota hospital service association (Blue Cross plan).

It is manifestly impossible in a review of this nature to go into the background of experience elsewhere which has led us to make certain decisions regarding what we think would apply in North Dakota. It is our belief that most of you will have a reasonable general knowledge of developments in the field of medical service plans so that you will be familiar with present day trends and the reasons for their development.

We have then come to the conclusion that the time has come for the North Dakota State Medical Association to sponsor a medical service plan offering a limited type of service. We believe this should be done as a sincere effort on our part to assist persons of low and medium income to provide insurance against the expense of larger illness, the so-called catastrophic illnesses. We feel that this is a public service worthy of the great traditions of medicine wherein the welfare of the patient is always paramount. We anticipate a highly favorable public response and urge the adoption of this plan as a measure which will greatly enhance the respect accorded the organized profession in the public mind. We definitely do not think of or propose this program as a financial advantage to the profession. The very nature of the plan is such that in most instances participating physicians will probably receive somewhat less payment for services rendered than they would in ordinary practice. This will especially apply to specialists and clinic groups. On the other hand, there are various tangible benefits such as prompt payment which should to a certain extent offset a slightly smaller fee. Further, it is anticipated that primarily our plan will appeal to the small wage earner, the so-called white collar class who in some instances are not able to pay very ordinary fees.

We wish especially to emphasize the fact that the plan is not being offered as a scheme for the benefit of the medical profession, but as a public service and primarily for the benefit of those who would like to budget their medical expenses, or at least insure themselves against surgical and obstetric expenses. It is to be hoped that in the discussion, this fact will be constantly in your minds, and if you feel that we are offering to make too much sacrifice for the general good, now is the time to express this opinion. The committee feels that the general advantages rather outweigh the disadvantages.

OUR PROPOSED PLAN

At our meetings to date we have drawn up a tentative plan which we submit to the house of delegates:

Name—North Dakota Physicians Service; a corporation with proposed by-laws summarized as follows:

Headquarters—Fargo. Membership of corporation is the house of delegates. Annual meeting coincides with annual meeting of house of delegates. Board of directors appointed by house of delegates. Outlines duties of board of directors.

Committees: Provides for central professional service committee of three directors to control all medical aspects of plan. Procedure for handling any complaints by or against a physician.

Officers: President, executive vice president and medical director, treasurer, secretary, other vice presidents. Outlines duties of each.

District committee: Provision for a district administrative unit where advisable and a district professional service committee which will serve under the central committee.

Subscribers: Any resident of North Dakota whose annual income does not exceed \$3000 per year may become an unlimited subscriber. One with an income above \$3000 may join as a limited subscriber. Free choice of physician is mandatory.

Payments to physician: Will be on the basis of agreed fee schedule subject to prorating in any month when bills exceed amount available for payments for service.

Participating: Any duly licensed medical doctor may become a participating physician by application to the corporation.

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This is a brief summary of the proposed by-laws which are written out in full in a later section.

There is also a proposed agreement between participating physicians and the corporation in which the regulations are outlined as to relationship between them. Section 1 defines the difference between an unlimited and a limited subscriber. In the case of a limited subscriber the physician may charge any fee he desires and apply what he receives from the corporation as a part payment. Whereas in the case of an unlimited subscriber, the physician agrees to accept the amount received from the corporation as payment in full for the particular service rendered. In effect, this means that a limited subscriber has a cash indemnity contract promising him specific maximum cash benefits for a specific situation, whereas the unlimited subscriber receives actual services without added cost, that is a service contract.

The pro rata feature is brought out here, but it is to be noted that deficits suffered in any one period are to be paid whenever a future surplus makes it possible.

The physician, of course, agrees to render whatever services are required without prejudice due to the fact that his patient is a subscriber. He is not obligated to accept any case, but should not refuse simply because the patient is a subscriber. In general the corporation role is concerned with financial matters and does not in any other respect change the traditional physician patient relationship.

The appended fee schedule is as everything else only tentative. However, it is felt that no very appreciable increases could be made in this schedule and still offer a satisfactory subscriber contract. Possibly some minor downward adjustments may be required. In general, however, we believe that this suggested schedule should remain as it is.

A complete sample subscribers contract has not been drawn up, but the proposed benefits, regulations, etc., have been discussed and a set of "definitions" have been drawn up. The portion of this report labeled definitions would form a part of, or become the basis of any subscribers contract. Any such contract will offer payment for surgical and obstetrical care

on^{1/2}, and would be a medical service contract of a restricted type, limited to specific types of disease.

The term surgical service shall mean any operative and cutting procedure for the treatment of diseases and injuries and the treatment of fractures and dislocations. Obstetrics means the treatment of conditions pertaining to pregnancy. Originally it was intended that payment should only be made for services rendered in an approved hospital. However, it is felt that this provision is not entirely suitable to conditions in North Dakota and it was decided to offer payment for surgery and obstetrics in the hospital, office or home. A final decision in this matter might well be left to the directors of any corporation set up. It may be noted here that some changes will be needed in the definitions as presented in order to make these provisions uniform throughout.

Methods of payment to limited subscribers and for different procedures during one hospital admission are provided for in section 3. Definite limitations must be imposed as to the services rendered. In general these are:

1. A limitation of \$150.00 as payment for any one or for a series of related surgical procedures.

2. Exclusion of hospital, laboratory, x-ray, nursing service, medicines, drugs, anesthesia and related services.

3. Compensable injuries are not to be included as well as various chronic diseases as tuberculosis, mental diseases and nervous disorders.

4. Tonsil and adenoid operations require a six months membership. Some similar provision might be necessary in the case of hernia and appendectomies for chronic appendicitis.

5. Obstetrical care is only available to those who have been members for 10 months. However, care for obstetrical conditions other than delivery at term may be furnished, provided the individual was not pregnant for 30 days following date of application. Obstetrical service of any kind would be available only to those joining in groups, not to individual subscribers.

Certain regulations are set up outlining relations between non-participating physicians and the corporation. It is likely that some adjustments may be needed here.

There are other mainly business provisions dealing with payments cancellations and in general with the relations of subscriber to the corporation.

This then is a summary of the main features of a proposed surgical and obstetric plan sponsored by the North Dakota State Medical association to be offered to the people of North Dakota in somewhat the following manner:

It is believed that at first it should be offered to employed groups and their families, groups of various sizes from four persons up. In general selling and collecting practices would be similar to those followed at present by the Blue Cross hospital plan. We believe that this plan can be offered at a rate between 80¢ to \$1.50 per month for an individual; \$1.30 to \$1.50 for man and wife; and \$2.00 to \$2.25 for a family. We are certain that there is a demand for such a contract, especially among the approximately 40,000 members of the Blue Cross hospital plan, and that in a short time there would be sufficient subscribers to make it self-supporting.

In operating medical service plans elsewhere, a considerable amount of cooperation with Blue Cross hospital associations has been found highly desirable. Even in Michigan, where the pioneer medical service was set up before the hospital association, they now have a working agreement with the Blue Cross, whereby the hospital people take care of certain selling and collection matters.

There are various possible combinations with the Blue Cross, or the plan could be handled by an entirely separate organization. It is our opinion that one of the following working arrangements should be made with the North Dakota Hospital Service association:

1. The present Blue Cross organization will handle all sales and collections, receive, process, and pay all claims subject to the approval of our medical director or central professional committee. The executive director of the Blue Cross would also then be the executive director of the medical plan. The corporation would reimburse the Blue Cross an agreed amount for these services, or

2. The Blue Cross would agree to attend to all sales and collection matters for a consideration, turning over all money

received to the corporation, who would receive, process, and pay all claims. A recent article in the AMA speaks approvingly of this method.

In our discussion of this proposal, we had favored the first arrangement outlined.

The economics committee submits the following proposal to the house of delegates:

1. That a medical service corporation be organized in accordance with the provision of House Bill No. 187.

2. That the by-laws, fee schedule, physicians agreement and subscribers contract be substantially as outlined in this report.

3. That the corporation be authorized to either make a satisfactory arrangement with the Blue Cross or set up their own business office as may be deemed best by the directors.

4. That nine directors be appointed, a majority of whom should be physicians and the others prominent citizens.

5. That the house of delegates loan the corporation a sum of not less than \$5000 to cover expenses incurred in organization, said loan to be an obligation of the corporation to the house of delegates.

W. A. WRIGHT, M.D., *Chairman.*

By-Laws, North Dakota Physicians Service

ARTICLE I—NAME

The name of this corporation is North Dakota Physicians Service.

ARTICLE II—PRINCIPAL OFFICE

The principal office and post office address of the corporation shall be Fargo, North Dakota.

ARTICLE III—SEAL

The Corporate Seal of the corporation shall have inscribed therein the name of the corporation and the words, "Incorporated 1945, North Dakota."

ARTICLE IV—MEMBERSHIP OF THE CORPORATION

Section 1. The members of the corporation shall consist of those persons who shall from time to time be members of the house of delegates of the North Dakota Medical association.

Section 2. Each member of the corporation shall be entitled to one vote.

Section 3. The annual meeting of the members of the corporation for the election by ballot of directors and the transaction of such other business as shall properly come before the meeting shall be held at such place as may be stated in the call of the meeting, on a date coinciding with the date of the annual meeting of the medical society of North Dakota. The election of the board of directors for the ensuing year shall be by majority vote of those members of the corporation present. The annual meeting of the board of directors shall immediately follow the annual meeting of the corporation.

Section 4. Special meetings of the members shall be called by the secretary whenever the board of directors or the president shall so order, or upon written request of five (5) or more members, and such request shall state the purpose of such meeting.

Section 5. Notice of the annual meeting and of all special meetings of the members shall be given by the secretary by mailing or delivering to each member at least seven days before the date fixed for the meeting a notice stating the place, day, hour and purpose of the meeting.

Section 6. At every meeting of the members, there shall be represented in person or by proxy at least a majority of the members to constitute a quorum, but a smaller number may adjourn from time to time.

ARTICLE V—BOARD OF DIRECTORS

Section 1. The affairs, properties and business of the corporation shall be managed by a board of nine directors, who may exercise all such powers of the corporation as are not by law or by these by-laws required to be otherwise exercised. Directors need not be members of the corporation. A majority of the directors shall be at all times persons approved in writing by the house of delegates of the North Dakota medical association. A majority of the directors shall be physicians registered to practice medicine in the state of North Dakota and members of the North Dakota state medical association, and engaged in the active practice of medicine in the state, and the remainder may be persons who are or who agree to become subscribers to the non-profit physicians service to be operated by the corporation.

Section 2. The incorporators at their first meeting shall elect three directors to hold office until the first annual meeting, three to hold office until the second annual meeting and three to hold office until the third annual meeting. At each annual meeting the members of the corporation shall elect three directors to hold office for a term of three years and thereafter until their successors are elected.

Section 3. Any director may be removed from office by a majority of the members of the corporation, either by writing filed with the secretary of the corporation or by a vote passed at a meeting of the said members.

Section 4. Vacancies in the board of directors occurring during the year shall be filled by a majority vote of those members of the corporation present at a meeting duly called for such purpose, provided, however, that at least 30 days prior thereto the said members shall submit to the president of the North Dakota state medical association the name of the person they propose to elect as a director.

Section 5. A majority of the directors in office for the time being shall constitute a quorum for the transaction of business, but a smaller number may adjourn from time to time.

Section 6. Regular meetings of the directors shall be held immediately after the adjournment of the annual meeting of the members of the corporation at the place of holding the annual meeting and at such regular times and places as the board of directors may determine. Special meetings may be held in like manner and shall be called by the secretary whenever the president or any three directors shall so request in writing, and three days' notice of such meetings shall be given to each director not joining in the request for such meetings. Directors may waive notice of a meeting by a writing signed before or after such meeting, and if present at any meeting shall be conclusively presumed to have received due notice thereof.

Section 7. The board of directors shall have power to purchase any property or rights and to enter into any contracts which they deem advantageous to the corporation, to fix the price to be paid by the corporation for such property, rights, or contracts, to borrow money, to issue bonds, debentures or other securities of the corporation and pledge to sell the same for such sums and at such prices as they may deem expedient; to adopt rules and regulations subject to the provisions of Article VI hereof and in general to exercise such other powers and to do all such other things as are not required by any other article of the by-laws to be exercised or done by any committee named therein. The board of directors shall have power to prepare, adopt, prescribe, approve and put into use contracts with subscribers, applications and contracts with participating physicians and surgeons, and such other forms of contracts and application forms as the corporation may require to transact its business; and such board of directors may, from time to time, alter, change, and amend such forms. The aforesaid powers shall be exercised by the board of directors subject to the provisions of the laws of North Dakota.

Section 8. Directors as such shall not receive any stated salary for their services, but by resolution of the board the actual expenses of the attendance, if any, may be allowed for attendance at board meetings. Nothing herein contained shall be construed to preclude a director from serving the corporation in any other capacity and receiving remuneration for such service.

Section 9. The board of directors may from time to time delegate any of its powers to committees or officers, attorneys or agents of the corporation, subject to such regulations as may be adopted by the board, provided, however, that no such delegation of its powers by the board of directors shall relieve the directors of the duties and obligations imposed upon them by the laws of the state of North Dakota or by these by-laws.

ARTICLE VI—COMMITTEES

Section 1. There may be appointed such committees as the directors deem necessary and there shall be appointed a central professional service committee as provided herein.

Section 2. There shall be a central professional service committee composed of three directors appointed by the president of the corporation, of whom two, including the chairman, shall be physicians registered to practice in the state of North Dakota. The chairman of the committee shall be designated by the president of the corporation.

Section 3. The central professional service committee shall have delegated to it control and supervision over the medical

aspects of all matters relating to (a) the standards of medical care to be furnished subscribers, (b) the extent and classification of benefits to be furnished subscribers, (c) the determination of income groups eligible to become subscribers, subject to approval of the board of directors, (d) the compensation fee schedule to be paid participating physicians and subject to the approval of the board of directors, (e) the admission and control of participating physicians and subject to the approval of the board of directors. All rules and regulations of the corporation relating to the foregoing shall be initiated by the central professional service committee, provided, however, that any rule or regulation relating to the determination of income groups eligible to become subscribers shall first be approved by the North Dakota state medical association and board of directors of the North Dakota physicians service. Whenever the committee shall initiate any change in a rule or regulation, it shall give at least 30 days' notice thereof to the members of the corporation.

Section 4. In the event of a complaint relative to the conduct of or services of a participating physician or of any controversy between a participating physician and a subscriber or whenever it has reason to believe that a participating physician has been guilty of a violation of the rules and regulations of the corporation, or unprofessional or unethical conduct or of conduct which is liable to endanger the interests of the corporation or of any of its subscribers, the committee may refer the matter for investigation to the county medical society or the district professional service committee within whose district the physician concerned has his principal office, which shall investigate the matter and shall then report the result of its investigation to the central professional service committee. If it appears to the central professional service committee that there is a reasonable cause to believe that the participating physician has been guilty of a violation of the rules and conduct which is liable to endanger the interests of the corporation or of any of its subscribers, it shall assign a date for a hearing giving the participating physician concerned at least seven days' notice thereof. If after the hearing at which the participating physician shall be given full opportunity to be heard, the said committee shall find the said physician guilty, it shall terminate the agreement between said physician and the corporation, or it may take other disciplinary action which is proper and appropriate in the circumstances, having first, however, reported to the board of directors of the North Dakota physicians service its findings and having obtained its approval of its proposed action.

Section 5. The central professional service committee shall report its acts and proceedings to the board of directors at such times as the board of directors shall require.

ARTICLE VII—OFFICERS

Section 1. The officers of the corporation shall be a president, a treasurer, a secretary, one or more vice presidents, and such subordinate officers as the board of directors shall from time to time elect with such powers and duties and for such terms of office as the directors may designate. The president shall be chosen from among the directors of the corporation, but other officers need not be. The directors at their annual meeting in each year shall elect the aforesaid officers, provided, however, that the incorporators in their first meeting shall elect a treasurer and secretary to hold office until the first annual meeting. All of the said officers shall hold their respective offices for one year and thereafter until their successors are elected and qualified, unless a different term shall be designated by the directors, subject, however, to removal at any time by vote of a majority of the board of directors, except that the officers appointed at the first meeting of the board of directors shall hold office until the first annual meeting and thereafter until their successors are elected and qualified. Vacancies in any of the said offices shall be filled for the unexpired portion of the term by the board of directors. Officers may be paid such salary or compensation as the board of directors shall determine.

Section 2. The president shall be the chief executive officer of the corporation. He shall preside at all meetings of the corporation. He shall see that all orders and resolutions of the board of directors are complied with.

Section 3. The executive vice president may also be the medical director of the corporation and may be a salaried officer, and shall be the chief administrative officer of the corporation

and carry out and perform the usual duties of such office, with such other powers and duties as may from time to time be prescribed by the board.

Section 4. The treasurer shall have charge of the corporation's financial affairs, subject, however, to the supervision and control of the board of directors. He shall have the custody of all money and securities except his own bond, which shall be kept by the president. He shall deposit all money and valuables in the name and to the credit of the corporation in such depositories as shall be determined by the board of directors, subject, however, to the provisions of the laws of the state of North Dakota. He shall disburse the funds of the corporation as ordered by the board of directors. He shall keep or cause to be kept the corporation's accounts in suitable books wherein every transaction shall be accurately recorded and shall render to the president and directors at regular meetings of the board, or whenever they require it, an account of his transactions as the treasurer and of the financial condition of the corporation and shall discharge all other duties properly appertaining to his office or which may be attached thereto by the board of directors. He shall give bond for the faithful discharge of his duties in such form and in such sum as the board of directors may require.

Section 5. The secretary shall keep the records of all meetings of the corporation and shall give notice of all meetings required by these by-laws. He shall have the custody of the record books of the corporation and shall perform all duties usually incident to the office of secretary and such other duties as may be from time to time assigned by the board of directors to him.

Section 6. The executive vice president, treasurer, and such other officers and employees of the corporation as may be designated by the board of directors shall be bonded at the expense of the corporation and in amounts determined from time to time by the board of directors.

ARTICLE VIII—DISTRICT COMMITTEES

Section 1. Each district medical society in the state of North Dakota may appoint a district professional service committee of not less than three (3) members of whom a majority shall be physicians engaged in active practice within the district and shall designate one of the members of the committee who is a physician as chairman.

Section 2. Each district professional service committee shall act in cooperation with and under the supervision of the central professional service committee. It shall make recommendations to the central professional service committee as to all matters within its jurisdiction.

Section 3. Each district professional service committee shall, whenever any matter relating to the services or conduct of a participating physician or relating to a controversy between a participating physician and a subscriber is called to its attention by a complaint or otherwise, fully investigate the matter and report thereon to the central professional service committee.

ARTICLE IX—SUBSCRIBERS

Section 1. A resident of the state of North Dakota may become an unlimited subscriber to the physicians service plan provided that his annual income does not exceed such amount as shall be fixed by the board of directors as provided in Article VI, Section 3, and provided further that he make application to become a subscriber as one of such a group as the board of directors may specify.

Section 2. A resident of the state of North Dakota may become a limited subscriber to the physicians service plan if his annual income exceeds such amount as shall be fixed by the board of directors on such terms and conditions as the board of directors may by regulations prescribe.

Section 3. A subscriber shall be entitled to receive from a participating physician such medical services as are included in the subscriber's contract with the corporation, subject to whatever rules and regulations may be adopted by the board of directors relative thereto. The corporation shall have no supervision over the amount to be charged by a participating physician for services to a limited subscriber.

Section 4. Subscribers shall have free choice among participating physicians subject to the provisions of Article XI, Section 3, hereof, and to the rules and regulations adopted by the board of directors.

Section 5. The board of directors shall have power to enter into arrangements and agreements with employers, societies, charitable or other organizations, and governmental agencies and authorities for the payment of part or all of the cost of medical care furnished to any persons who may be entitled to such care under the rules and regulations adopted by the board of directors.

ARTICLE X—PAYMENTS TO PHYSICIANS

1. There shall be included in the minutes of the meetings of the board of directors a record of the approval of payments to be made to participating physicians.

2. No payment to any participating physician shall be authorized by the board except in accordance with a plan of payments adopted by the central professional service committee and recorded in the minutes of a meeting.

3. The plan of payment so approved by the board shall be determined after consideration of the net earned subscription income that may be estimated to become available to the corporation during any given period for the payment of participating physicians' fees, after setting up legal reserves and reserves for expenses, contingencies, seasonal fluctuation in hospitalization of medical cases, and the like, and the determination of the board with regard thereto shall be final and conclusive.

4. Whenever in any given period (the length of which shall from time to time be determined by the board) the amount of money determined as aforesaid anticipated to become available for payment of then current participating physicians' bills, does not suffice to pay the full amount thereof as established therefore in the then current schedule of benefits, payment to participating physicians may be paid proportionate to such amount in full payment for the eligible services rendered by such participating physician and the determination of the board with regard thereto shall be final and conclusive.

5. Payment to eligible non-participating physicians shall be on the basis provided therefore in the subscription contracts.

ARTICLE XI—PARTICIPATING PHYSICIANS

Section 1. Any physician, a member of the North Dakota state medical association, may become a participating physician on complying with the provisions of these by-laws and the rules and regulations of the corporation.

Section 2. A physician desiring to become a participating physician shall make written application in the form prescribed by the rules and regulations and shall before becoming entitled to act as a participating physician enter into a written agreement with the corporation in the form prescribed by the rules and regulations.

Section 3. Subject to the code of ethics of the American Medical Association a participating physician shall have the right to accept or reject patients so far as subscribers are concerned and the right to discontinue treatment of any subscriber according to the code of ethics of the American Medical Association, provided, however, he shall not have the right to refuse to accept a subscriber as a patient or to discontinue treatment of a subscriber for the reason that he is a subscriber, and such refusal shall constitute grounds for the termination by the corporation of its agreement with the participating physician.

Section 4. A participating physician shall not request or accept from anyone whom he knows to be an unlimited subscriber any compensation for such services as such subscriber is entitled to under his contract with the corporation, except such charges, if any, as may be provided in the rules and regulations adopted by the board of directors and set forth in the subscriber's subscription certificate.

ARTICLE XII—NON-PARTICIPATING PHYSICIANS

Any physician, a member of the state medical association, who is not a participating physician of the North Dakota physicians service is considered a non-participating physician.

ARTICLE XIII—RULES AND REGULATIONS

The corporation shall formulate and adopt such rules and regulations as it may deem necessary or expedient for the proper administration of the medical service plan operated by the corporation.

ARTICLE XIV—GENERAL

These by-laws may be amended or repealed by vote of two-thirds ($\frac{2}{3}$) of the members of the corporation present or by proxy at any regular meeting or at a special meeting called for that purpose, of which due notice has been given to each mem-

ber with a copy of the proposed amendments. Copies of all amendments to the by-laws shall be filed with the commissioner of insurance within 30 days after adoption.

Schedule of Surgical and Obstetrical Benefits

GENERAL SURGERY—10

(Operation; pre-post-operative hospital care)

INFECTS AND TRAUMATA—11

Abscesses and boils (superficial), incision	\$ 5.00
Abscesses (deep) incision and drainage	20.00
Deep cervical abscess	75.00
Carbuncle, operative (surgical procedure only)	25.00
Tendon of hand, repair, one primary	50.00
Each additional	10.00
Maximum	100.00
Septic finger or hand (tendon sheath involvement)	50.00
Grafts, skin	15.00 and up

CYSTS—12

Cysts, sebaceous, removal	10.00
Cysts, complicated	20.00
Pilonidal cyst or sinus	50.00
Cysts, bone, removal	75.00
Bursa, excision of	50.00

TUMORS—13

Tumors, external, removal	10.00
Tumors, complicated, removal	25.00
Tumors, vocal cord, removal—entire	75.00
Epulis, removal	15.00
Parotid tumor, removal	100.00
Cancer of tongue (resection or removal)	125.00
Same with neck dissection	150.00
Cancer of lip (local operation)	35.00
Same with neck dissection	125.00

Biopsy—14

Biopsy, superficial	10.00
Biopsy, bone, operative	15.00
Biopsy, needle aspiration	5.00

GLANDS—15

Glands, superficial, removal	10.00
Dissection glands of neck (for cancer)	100.00

THYROID—16

Thyroid, gland, simple ligation	75.00
Lobectomy	100.00
Thyroidectomy, subtotal (bilateral)	125.00
Ligation preliminary to thyroidectomy	25.00
Thyroidectomy, two-stage, subtotal (with or without ligation)	150.00
Parathyroidectomy	150.00

BREASTS—17

Breast abscess, drainage	20.00
Breast tumor, removal	25.00
Breast, radical removal	150.00
Breast, simple removal	75.00

MISCELLANEOUS—18

Saphenous vein, low	15.00
Ligation, saphenous vein, high (and combined one leg and subsequent injection)	37.50
Extensive bilateral varicose veins (Multiple ligations on same or successive days) injections	75.00
Toe nail, ingrown (radical removal)	5.00
Stone submaxillary or parotid duct (complicated)	25.00
Removal of coccyx	25.00

SPECIAL SURGERY—19

THORACIC SURGERY—20

Bronchoscopy, operative	75.00
Pleura, paracentesis (preliminary to surgery)	7.50
Empyema, closed drainage	50.00
Empyema, rib section	50.00
Phrenic nerve, crushing	25.00
Abdomen, paracentesis	10.00
Herniotomy, single, ventral, inguinal, or femoral	75.00
Herniotomy, bilateral, inguinal (same or successive days)	110.00
Esophagus, dilation (1)	10.00
Esophageal diverticulum, one stage or two stage	125.00
Gastrotomy	100.00
Gastrectomy	150.00
Gastric ulcer, excision	100.00

Gastro-enterostomy	150.00
Peptic ulcer, perforated, closure	100.00
Pyloric stenosis (Rammstedt's in infant)	100.00
Intestines, anastomosis	150.00
Intestines (small) resection	150.00
Colon, resection (with one closure colostomy)	150.00
Colotomy, palliative (no subsequent surgery)	50.00
Appendectomy	100.00
Diverticulum, intestinal	100.00
Appendiceal, abscess, drainage	100.00
Cholecystectomy	150.00
Biliary surgical drainage—common duct and cholecyst-	
ectomy	150.00
Common duct, resection or reconstruction	150.00
Cholecystostomy	100.00
Cholecystoduodenostomy	125.00
Pancreas, drainage	125.00
Splenectomy	150.00

PROCTOLOGY—22

Hemorrhoidectomy, external	10.00
external multiple	25.00
Hemorrhoid, thrombosis, incision	5.00
Hemorrhoidectomy, internal and external	50.00
Fistulectomy	50.00
Fissurectomy	15.00
Polypectomy (rectal)	25.00
Carcinoma of rectum, extirpation	150.00
Sphincter, dilation	5.00
Perianal abscess, drainage	5.00
Prolapsed rectum, repair	100.00

UROLOGY—23

Cystoscopy, observation (preliminary to surgery)	15.00
Cystoscopy, ureteral catheterization (preliminary to surgery)	25.00
Cystoscopy, operative (radium, stone, biopsy, etc., fulguration, foreign body)	50.00
Circumcision, child	10.00
Circumcision, adult	20.00
Urethrotomy, external	50.00
Urethrotomy, internal	50.00
Prostatic abscess	50.00
Prostatectomy, perineal	150.00
Prostatectomy, suprapubic—complete	150.00
Prostatectomy, transurethral	150.00
Punch operation with suprapubic drainage	125.00
Perineoplasty	75.00
Hydrocele, sclerosing	10.00
Hydrocele, radical operation	50.00
Litholapaxy	75.00
Vasectomy (when not preliminary to prostatectomy)	25.00
Vesiculectomy	100.00
Orchidopexy, one stage	50.00
Two stage	75.00
Orchidectomy, simple	50.00
With gland dissection	100.00
Cystotomy or cystostomy	50.00
Cystectomy	125.00
Plastic surgery in epispadias and hypospadias	150.00
Plastic surgery of renal pelvis and ureter	100.00
Bladder tumor, fulguration	25.00
Bladder tumor, open removal	75.00
Bladder tumor, diverticula, etc. (resection)	100.00
Ureterolithotomy	100.00
Nephrotomy	100.00
Nephrostomy	100.00
Nephrectomy	150.00
Nephropexy	100.00
Pelotomy	100.00
Excision and suture of fistula, suprapubic	100.00
Vaginal	150.00

OBSTETRICS—24

Pregnancy, delivery with complete care (after 10 mos.)	50.00
Miscarriage (curettage) after 10 months	25.00
Cesarean section, vaginal	100.00
Cesarean section, abdominal	100.00
Pregnancy, ectopic	100.00
Therapeutic abortion	50.00

GYNECOLOGY—25

Bartholin's gland, incision	5.00
Bartholin's gland, excision	25.00
Urethral caruncle, removal	15.00
Labial tumors and cysts, removal	25.00
Fistula, recto-vaginal	100.00
Fistula, vesico-vaginal	150.00
Cul-de-sac, drainage	35.00
Cauterization of cervix (conization diathermy)	5.00
Dilatation and curettage	25.00
Uterine polyp, removal	25.00
Trachelorrhaphy	35.00
Cervix, amputation	50.00
Oophorectomy (bilateral) or resection of ovaries	100.00
Hysterectomy, vaginal	150.00
Supravaginal hysterectomy, abdominal	150.00
Supravaginal hysterectomy, abdominal (complicated with gynecologic repair work)	150.00
Pan hysterectomy for cancer	150.00
Myomectomy	100.00
Salpingectomy	100.00
Salpingoophorectomy (bilateral)	100.00
Cystocele	50.00
Rectocele	50.00
Combined cervical and vaginal repair (no proctenctia)	75.00
Prolapse operations (interposition, Manchester)	100.00

OPHTHALMOLOGY—26

Foreign body, interior eye, operative removal	100.00
Conjunctival suture	5.00
Conjunctival flap for corneal ulcer, etc.	15.00
Chalazion (excision)	10.00
Lachrymal sac, removal	75.00
Entropion or ectropion	50.00
Symblepharon, release	30.00
Pterygium	35.00
Corneal ulcer, cauterization	10.00
Ptosis (single)	50.00
Strabismus, one stage	50.00
Strabismus, two or more stages	75.00
Cataract, needling	25.00
Cataract, removal	100.00
Iridectomy and conjunctival flap	75.00
Glaucoma, filtrating operation	100.00
Enucleation	50.00 plus
Eviceration	50.00
Tumor, exenteration of orbit	150.00
Detachment of retina, surgical treatment	150.00
Suture of skin of eyelids	10.00

OTOLOGY—27

Paracentesis tympani (hospital)	10.00
Mastoidectomy, acute	75.00
Mastoidectomy, radical	100.00

NOSE AND THROAT—28

Tumor vocal cord	75.00
Antrum, Caldwell-Luc, window	35.00
Ethmoidectomy, unilateral	25.00
Ethmoidectomy, bilateral	50.00
Frontal sinus, internasal	50.00
Frontal sinus, radical	75.00
Submucous resection	50.00
Tonsillectomy and adenoidectomy	35.00
Abscess, peritonsillar, incision	5.00
Larynx, intubation	15.00
Larynx, polyp, tumor, removal	50.00
Laryngectomy	100.00
Tracheotomy	35.00
Esophagoscopy or bronchoscopy for diagnosis and treatment	25.00
Esophagoscopy, foreign bodies, esophagus, trachea, lung	100.00

NEURO-SURGERY—29

Chordotomy, bilateral	75.00
Chordotomy, unilateral	75.00
Craniotomy for tumor, abscess, depressed fracture	150.00
Decompression, subtemporal	100.00
Encephalogram—introduction of material (x-ray extra)	15.00
Laminectomy, cord tumor	150.00

Laminectomy, intervertebral disc	100.00
Lumbar puncture	5.00
Nerve anastomosis (individual consideration)	75.00
Section, anterior scalenus (scalenus syndrome)	25.00
Section, 5th nerve (tri-geminal neuralgia)	50.00
Section, 8th nerve (Meniere's syndrome)	50.00
Skull defect, plastic operation	50.00
Splanchnicectomy	100.00
Trephine, subdural hematoma	50.00
Ventriculogram—introduction of material (x-ray extra)	25.00

BONE, JOINT, TENDON SURGERY—30

Skull	50.00
Nose	10.00
Maxilla	25.00
Body of vertebra—closed reduction	50.00
Ribs	10.00
Clavicle	35.00
Scapula	40.00
Humerus	50.00
Olecranon	35.00
Radius and ulna, shaft	60.00
Radius, shaft only	35.00
Cole's fracture	35.00
Ulna, shaft only	25.00
Fracture, head of radius	30.00
Metacarpals and carpal	35.00
Scaphoid, closed	30.00
Finger	10.00
Each extra finger	5.00
Pelvis	70.00
Femur	100.00
Tibia, shaft	50.00
Tibia, internal malleolus	35.00
Fibula, shaft	25.00
Tibia and fibula (including Pott's fracture and trimalleolar)	75.00
Metatarsal bone	5.00
Tarsal bone, excluding os calcis and astragalus	35.00
Os calcis and subastragalus, each	50.00
Great toe	10.00

For fractures requiring an open operation—(32)—the maximum amount of reimbursement will be 30% of the amount shown above for corresponding simple fractures up to \$150.00.

COMPOUND FRACTURES—33

All compound fractures are allowed 30% more than the fees of simple fractures up to \$150.00.

FRESH, UNCOMPLICATED DISLOCATIONS—34

Spine	\$
Maxilla, inferior	10.00
Clavicle	25.00
Clavicle, requiring open operation	50.00
Shoulder	25.00
Elbow	25.00
Shoulder and elbow, requiring open operation	50.00
Wrist	15.00
Metacarpal bone, one	15.00
Each extra metacarpal	5.00
Metacarpal bone requiring open operation—charge is doubled.	
Carpal bone, one	25.00
Carpal bone, one or more requiring open operation	50.00
Finger, one	5.00
Each extra finger, additional	5.00
Finger, one; requiring open operation	10.00
Each additional finger	10.00
Hip	45.00
Hip, requiring open operation	90.00
Knee	25.00
Knee, requiring open operation	50.00
Tarsal bone	25.00
Tarsal bones requiring open operation, double the charge.	
Metatarsal bone, one	15.00
Each additional bone	5.00
Toe, one	5.00
Each additional toe	5.00

ORTHOPEDIC—35

Tenotomy	\$ 25.00
Bone graft	(Individual consideration)
Acute osteomyelitis	" "
Chronic osteomyelitis, sequestrum removal	" "
Arthrodesis of knee, hip, shoulder or elbow	" "
Arthroplasty, any major joint	" "

AMPUTATIONS—36

Shoulder	100.00
Upper arm	50.00
Forearm	50.00
Hand	50.00
Finger	25.00
Each additional finger	10.00
Hip	100.00
Thigh	65.00
Leg	75.00
Toe	25.00
Each additional toe	10.00
Foot	65.00

BLOOD TRANSFUSION—37

Blood transfusion, first (not including cost of blood; when given by licensed physician personally, during hospitalization):

For major surgery	10.00
Subsequent	5.00
Maximum	25.00

RULES AND REGULATIONS CONCERNING THE SCHEDULE OF SURGICAL AND OBSTETRICAL BENEFITS

Compensation on the fee schedule with the agreement of apportionment by the participating physicians is the primary basis of a pre-payment medical plan. The endeavor of the corporation will be always to meet the scheduled payments in full. However, in a particular accounting period, if the available funds are inadequate, then the payment for each service performed by a physician and due the physician will be lessened.

The schedule of benefits is based on these few important facts: first, that the subscriber in the lower income classes should be carried as nearly through the whole hospitalized case as possible; second, that the specific allowance to physicians are fair, assuming that the difficult cases and the easier cases will balance fairly with each other; third, that the professional experience of collection for a large number of accounts is replaced by the payment from the corporation for 100 per cent of the cases; and fourth, that many of the cases formerly medically indigent, will become self-supporting by group enrollment for medical service at a low subscription fee.

1. Subscribers in the under-income group (individuals with an income below \$2400 and families with a total income below \$3000) receive unlimited or service benefits, as contrasted with cash indemnity benefits. Participating physicians agree to provide specified services to this group without extra charge other than contractually provided. Subscribers in the over-income group (individuals with incomes above \$2400 and families with incomes above \$3000) receive limited or indemnity benefits. The individual's benefits are paid directly by the corporation to the participating physician of the amount specified for a given service. Such payment stands as a credit toward the payment of the full charge which the participating physician is free to make in the same manner as he would with a non-subscriber patient. The latter patients are liable directly to the physician for any remaining balances after the corporation pays the indemnity.

2. In cases of fractures requiring an open reduction, the amount of reimbursement will be 30 per cent more than the amount shown in the fee schedule, and in cases of compound fractures, the amount of reimbursement will be 30 per cent more than the amount shown in the fee schedule for corresponding simple fractures but not to exceed \$150.00, but the limit of care in such cases if in excess of 21 days, is extended until the patient is discharged from the physician's care.

3. Two unrelated operations performed during a single hospital admission shall be paid for on the basis of full payment for that service having the larger compensation and reduced payment for the service with the smaller compensation. If the

smaller compensation is for a major operation, two-thirds ($\frac{2}{3}$) credit shall be allowed; if for a minor operation, one-half ($\frac{1}{2}$) credit shall be allowed. This also relates to combined procedures on related organs (i. e., intestine), with the total not to exceed \$150.00 in those combinations which are not otherwise specifically provided for in the schedule. When two unrelated operations are performed by different surgeons during a single hospital admission the subscriber or covered dependent shall receive full credit for each operation except if the total of the two exceeds \$150.00—then credit shall be prorated on the basis of the fee schedule in effect. Unlimited subscribers may not be charged extra by the participating physician or physicians if unrelated or related operations are performed by one or more physicians during a single hospital admission and the combination of the compensation amounts exceeds \$150.00 except as limited by IV, d, of the subscriber contract.

When a series of related surgical procedures are performed at the same time, or different surgical procedures arising from the same medical cause are performed during the same or successive hospital admissions, no benefits in excess of one hundred fifty dollars (\$150.00) will be paid during any one subscription year on behalf of either limited or unlimited subscribers or their covered dependents.

4. Exceptions to regulation 3 are with regard to bilateral herniae, which are specifically provided for. Incidental appendectomy performed in the course of any other operation, is allowed no extra compensation.

5. Waiting periods are established for two types of services. The waiting period is that time between the effective date of a subscription agreement and the time when the subscriber is eligible for benefits. For obstetrical conditions including normal delivery, curettage, and treatment of miscarriage, laparotomy for extra-uterine pregnancy and cesarean section, there is a waiting period of ten (10) months. For tonsillectomy or adenoidectomies there is a waiting period of six (6) months.

6. Services of other than the operating surgeon in major surgical cases (\$75.00 or over) are arranged for on the following basis: (a) Special endoscopic examinations are compensable according to the fee schedule when such examinations are made by a participating physician on a hospitalized patient immediately preceding surgery and when directly related to the surgical procedure (excluding proctoscopy and auriscopy by the operating surgeon). (b) Obstetrical services when provided by a participating physician under the terms of the waiting period in the subscriber's contract.

7. Services rendered by non-participating physicians of North Dakota to a subscriber shall be paid not more than three-fourths ($\frac{3}{4}$) of the amount that would have been paid to a participating physician. Non-participating physicians outside of North Dakota will be paid at the same rate as participating physicians. Non-participating physicians may make an extra charge over and above the amount received from the North Dakota physicians service.

8. Adjustment of all disputed claims shall be made through the corporation offices and through the mediation of officers and agents of the corporation, and the central and local professional service committees.

9. All cases should be reported within thirty (30) days after completion of treatment. Cases reported later than sixty (60) days after services are completed need not be compensated by the corporation except at its discretion. This is necessary to prevent disruption of the corporation's financial planning. Late reported cases shall be penalized at the rate of two per cent simple discount per month to help defray administrative costs. Accounts will be settled within the month following the date of receipt by the corporation of the discharge report.

10. The subscriber's contract does not cover injuries or diseases for which care, or treatment or compensation is provided under any workmen's compensation, or other legislation in force at present or subsequently enacted. Double liability is not accepted as set forth in Article XIV of the subscriber's contract.

11. The subscriber's contract does not provide for distinctly medical (non-operative) treatment in the hospital; it does not provide for treatment of nonoperable conditions by a surgeon or orthopedist or obstetrician in the hospital. All such matters are the private responsibility of the patient toward the participating physician involved.

12. The subscriber's contract provides for "surgical and obstetrical services" (see 6 above), with the surgical services defined as "any operative and cutting procedure for the treatment of disease or injury, and the treatment of fractures and dislocations."

APPLICATION OF AND AGREEMENT WITH
PARTICIPATING PHYSICIANS

I, the undersigned, a physician licensed to practice medicine in the state of North Dakota, pursuant to _____, hereby make application to become a participating physician of the North Dakota Physicians Service, a corporation organized under the provisions of _____ of the statutes and the acts supplementary thereto and amendatory thereof (hereinafter referred to as the corporation), do hereby agree to furnish to subscribers and covered dependents, medical services in accordance with and subject to the provisions of contracts made between the corporation and the subscribers, which are now in effect or may be in effect during the term of this contract.

1. The corporation will compensate the participating physician in accordance with the fee schedule now on file with the corporation or as subsequently modified or amended for such services furnished to subscribers or their covered dependents. The said fee schedule and any modifications or amendments thereof are made a part of this agreement. (Copies are available at any time from the corporation.) The participating physician agrees to accept as full compensation for all such services such payments as are received from the corporation under the terms hereof, except in the case of those persons who are entitled only to limited indemnification, in which case the physician may make his customary charge to his patient for such services, crediting against such charge the amount set forth for such services in the fee schedule in effect at the time the services are rendered.

II. In the event that the amount available in any accounting period for distribution to participating physicians, after paying or making provision for all other expenses of the corporation shall be insufficient to pay all participating physicians in full, then the amount which the board of directors decides is available for distribution shall be paid to all participating physicians on a proportionate basis. The participating physician may subsequently receive an additional amount or amounts if the board of directors decides that sufficient funds are available and votes to make such additional payment, but in no case shall the total payment exceed the regular fee schedule in effect at the time the services are rendered.

III. The participating physician agrees to report discharge of subscriber participants, on a form furnished by this corporation, within 30 days from the date of discharge. Cases not reported as above required need not be compensated for by the corporation except at its discretion, but the subscriber or covered dependent concerned shall be in no way penalized because of the failure of the corporation to compensate said physician. Any late reported cases accepted by the corporation for cause shall be discounted at the rate of 2 per cent simple discount per month to help defray administrative costs. The participating physician shall, upon request, render to the corporation a statement of services rendered. The corporation, when making payment to the participating physician, shall render to him an itemized voucher.

IV. This contract shall continue in effect until terminated by the participating physician on the last day of any calendar month after he has been affiliated therewith for a period of one year, by delivering to the service association written notice of his intention so to do 90 days before such withdrawal shall become effective. Such withdrawing physician shall remain obligated to render medical service pursuant to the subscribers' contracts outstanding at the effective date of such withdrawal. However, the contract may be terminated by the corporation forthwith for any cause as set forth in article VI, section 4 of the by-laws of the corporation.

V. In the event of termination of the contract the physician shall be entitled to be paid for all services rendered to the date of termination, provided, however, that if the contract shall be terminated by the physician for any other cause than that he is no longer practicing in North Dakota, he shall be paid at a future date as the board of directors decide such amounts that have resulted from any previous failure to pay the full amount

set forth in the fee schedule as provided in paragraph III above.

VI. The participating physician agrees to be bound by the articles of incorporation and by-laws of the corporation and he does hereby acknowledge having received from the corporation copies thereof. The participating physician also agrees to abide by any rules and regulations from time to time as are adopted by the corporation.

Signature _____, M.D.

Accepted, North Dakota Physicians Service.

By _____

Date _____

I. DEFINITIONS

(a) *Applicant subscriber.* The term "applicant subscriber" shall mean the employed individual named on the application with whom the participating physicians have entered into this surgical and obstetrical service contract.

(b) *Covered dependent.* The term "covered dependent," as used herein, shall mean wife, unmarried child under 19 years of age, or dependent husband of applicant subscriber residing with the applicant subscriber. No applicant subscriber is eligible to be a dependent on any other applicant subscriber's contract, nor may any person be a dependent on more than one applicant subscriber's contract.

(c) *Subscriber.* The applicant subscriber and each person named on the association's records as a dependent shall be a subscriber under this contract.

(d) *Surgical and obstetrical service contract.* The term "surgical and obstetrical service contract" shall mean the contract entered into between the participating physicians and the applicant subscriber, and shall consist of the application, including any supplemental application, the identification card and the surgical and obstetrical service contract issued by the service association, as agent of the participating physicians, evidencing the acceptance of the application.

(e) *Participating physician.* The term "participating physician" shall mean any physician who has entered into a contract with the service association to furnish surgical and other services.

(f) *Non-participating physician.* Any physician, a member of the state medical association, is considered a non-participating physician.

(g) *Group leader.* The term "group leader" means any individual, association, or corporation which, as agent for certain subscribers, has agreed with the subscriber to collect the charges payable to the subscriber and to transmit the same to this corporation. Such remitting agent shall not be, nor be construed to be the agent of this service association.

(h) *Surgical service.* The term "surgical service" shall mean any operative and cutting procedure for the treatment of disease and injuries, and the treatment of fractures and dislocations.

(i) *Surgical and obstetrical services.* The term "surgical and obstetrical services" shall mean services rendered by a participating physician to a subscriber or covered dependent when a bed patient is in an approved hospital, home or office, as follows: surgical services, and obstetrical services.

(j) *Annual income.* The term "annual income" shall mean the combined income of subscriber, spouse, and other dependents covered under the contract for a yearly average during a three year period preceding application for benefits hereunder.

(k) *Unlimited subscriber.* The term "unlimited subscriber" shall mean any subscriber whose annual income is less than the amounts specified by the service association, and on file with the commissioner of insurance.

(l) *Limited subscriber.* The term "limited subscriber" shall mean any subscriber whose annual income is more than the amounts specified (j) above.

(m) *Approved hospital.* The term "approved hospital" shall mean a hospital that has been approved by the American College of Surgeons, or by the American Medical Association, or by the county, or component medical societies of this state.

(n) *Duration.* Unless terminated as herein provided, the duration of each contract herein referred to as the contract year shall be the period of twelve months from its effective date and from year to year thereafter.

(o) *Obstetrics.* "Obstetrics" means the treatment of conditions pertaining to pregnancy such as actual delivery, miscarriage, cesarean section, ectopic pregnancy, and therapeutic abortion.

II. BENEFITS TO SUBSCRIBERS

Unlimited Subscribers:

This service association, through participating physicians, will provide the unlimited subscribers and covered dependents as defined and limited herein:

1. Surgical services as hereinbefore defined by a participating physician in an "approved hospital," doctor's office and patient's home, except as limited by IV, d.

2. Obstetrics, meaning the treatment of conditions pertaining to pregnancy.

III. LIMITED SUBSCRIBERS

Limited Subscribers:

The service association shall pay the participating physician in accordance with the fee schedule in effect at the time the services are rendered for the services specified in paragraphs (a) and (b) of this section. Such schedule amount shall be a credit toward the full charge to the subscriber, the balance of which, if any, shall be the responsibility of the subscriber to the participating physician.

(a) Surgical services as hereinbefore defined by a participating physician in an "approved hospital, doctor's office and patient's home," except as limited by IV, d.

b. Obstetrics, meaning the treatment of conditions pertaining to pregnancy.

(c) When two unrelated operations are performed by one surgeon during a single hospital admission, the subscriber or covered dependent shall receive full credit for that service having the larger compensation and reduced payment for the service having the smaller compensation. If the smaller compensation is for a major operation, $\frac{2}{3}$ credit shall be allowed. If a minor operation, $\frac{1}{2}$ credit shall be allowed. (See IV, d.)

(d) The schedule of indemnification for benefits under this contract shall at all times be on file in the office of the corporation and in the office of the commissioner of insurance, and copies shall be provided to subscribers on written request. This schedule shall be subject to change without notice after any change has been approved by the commissioner of insurance.

IV. CONDITIONS UNDER WHICH SERVICE SHALL BE PROVIDED OR INDEMNIFICATION SHALL BE PAID

The aforementioned services for both the unlimited and limited subscribers and covered dependents, shall be rendered under the terms and conditions of the following:

(a) The applicant subscriber or covered dependent may apply to any participating physician for service.

(b) The service association agrees to make payment direct to the physician performing the services, and acceptance of payment from the association by such physician shall be a discharge of the obligation of the association to the applicant subscriber or covered dependent for any services rendered or for any indemnity due under this contract.

(c) When a series of related surgical procedures are performed at the same time, or different surgical procedures arising from the same medical cause are performed during the same or successive hospital admissions, no benefits in excess of \$150.00 will be furnished during any one subscriber's year, except as otherwise provided in the fee schedule.

(d) If the subscriber claims the benefits to which an unlimited subscriber is entitled under the terms of this contract, he shall furnish the participating physician and/or the association all information which the participating physician or the association may request relative to his income and that of his covered dependents. If the subscriber refuses or fails to give such information when requested or he gives false or misleading information, his subscriber's contract may be cancelled and he shall be responsible to the participating physician for the fee charged to him.

V. SERVICES EXCLUDED

The following services are not included as benefits under this physician's service contract:

(a) Hospital services, nursing service, medicines, drugs, anesthesia, operating room, x-rays, laboratory examinations, nor for any services whatever to which the applicant subscriber or covered dependents are entitled under any non-profit hospital service plan contract under which the hospital admission occurs.

(b) Services which have been rendered to an applicant subscriber or covered dependent under workmen's compensation

laws of any state, the employers' compensation or liability acts under the federal statutes or where care is rendered without cost under any government agency, or crippled children's program, or by similar allied agencies.

(c) Diseases or injuries not ordinarily treated in an approved hospital.

(d) Tuberculosis, mental disorders and nervous disorders.

(e) Tonsillectomies, adenoidectomies during the first six months of membership.

(f) Obstetrics or any condition arising from current pregnancy or childbirth until this contract has been in effect for ten (10) consecutive months. No obstetrical services are available under the individual contract.

(g) Plastic surgery except for non-cosmetic purposes.

(h) This contract does not provide benefits of a distinctly medical service (non-operative) in a hospital; it does not provide benefits for services in a hospital of a non-operative character not included under "surgical and other services" as hereinbefore defined (sec. I, g) by a surgeon or obstetrician. Services performed in the home or the doctor's office are at the discretion of the attending physician.

(i) This service association does not provide payment for service of any hospital resident, physician, or intern.

VI. CHOICE OF PHYSICIAN AND PATIENT

Choice of physician may be made by applicant subscriber or covered dependent from among the then current participating physicians of the service association, and like choice is reserved also to such physicians to accept patients from among applicant subscribers and covered dependents in accordance with the custom and practice now prevailing in the private practice of medicine. Nothing contained herein shall interfere with the ordinary relationship that exists in the community between a physician and his patient. This service association does not undertake to supply a physician for any applicant subscriber or his covered dependents.

VII. SERVICES BY NON-PARTICIPATING PHYSICIANS

The service association agrees to indemnify the applicant subscriber or covered dependent for the cost of surgical or other services rendered by a physician other than a participating physician only in case of emergency. For such services by a non-participating physician practicing and residing within the state of North Dakota, the service association shall pay not over three-fourths ($\frac{3}{4}$) of the amount which a participating physician would receive for such services, and subject to the limitations and exclusions of the subscriber's contract. For such services by a physician practicing and living outside of the state of North Dakota, the service association shall pay the non-participating physician at the same rate as paid to a participating physician hereunder. The service association has no authority to limit a non-participating physician as to his total charge for surgical and other services. "Emergency" as used herein shall mean an accident or illness of such character that the safety or recovery of the subscriber would be jeopardized unless treated by a non-participating physician.

VIII. IDENTIFICATION

At the time surgical or other services are requested, the applicant subscriber or covered dependent shall inform the participating physician that he is an applicant subscriber or covered dependent.

IX. CORPORATION NOT LIABLE FOR INJURIES

The service association shall not be liable to applicant subscribers and covered dependents for injuries resulting from negligence, misfeasance, malfeasance, nonfeasance, or malpractice on the part of any officer or employee or on the part of any participating physician or non-participating physician in the course of rendering benefits and services to applicant subscribers or covered dependents.

X. CANCELLATION AND RENEWALS

(a) The amount of the annual charges for a subscriber shall be determined by the board of directors of the North Dakota Physicians Service from time to time.

(b) The amount of the annual charges as above determined, and the time or times and manner of payment thereof shall be as set forth in the subscription application or supplemental application and as specified thereon by the applicant subscriber.

(c) This service contract shall be terminated and cancelled without notice if the charge therefor is not paid within 30 days after the same becomes due and payable. Re-enrollment of an applicant subscriber whose contract has become terminated and cancelled for any reason may be applied for subject to the consent and approval of the service association upon the same basis as new applicants, except that a fee of \$1.00 for such re-enrollment shall be paid by the applicant subscriber.

(d) Subscription charges and the provisions of the service contract may be changed at any time and from time to time by the board of directors of the corporation by giving written notice thereof to the subscribers, at least 15 days prior to the date on which such change shall take effect. Any such change shall not affect the rights of any applicant subscriber or covered dependent who at the time of such change is receiving surgical or other services provided herein to the completion thereof under the terms of the subscriber's contract.

(e) Any such agreement may be terminated by the corporation by giving 15 days prior notice to the subscribers. Any such termination shall not affect the right of an applicant subscriber or covered dependent then receiving surgical or other services to the completion of such services under the terms of the subscriber's contract. In the event of such termination, this corporation shall refund to the subscriber the subscription charges, if any, which shall have been paid by the subscriber for a period beyond the date of such termination. Payments of such refund shall constitute a full and final discharge of all obligations of the corporation under this subscriber's contract.

(f) Surgical and obstetrical service contract may be terminated by the subscriber on the next monthly effective date by giving 15 days prior written notice to this corporation. In the event of any such termination, this corporation shall not refund to the subscriber the subscription charges, if any, which shall have been paid by the subscriber for a period beyond the date of termination, unless such period is in excess of 30 days. Any such refund shall be pro-rated according to the period for which coverage has been provided.

(g) An applicant subscriber who leaves the employ where he has participated in the plan may continue his membership until the end of his contract year whether he is re-employed or not by making remittance, subject to the conditions of this service contract, directly to the association's office. To each such subscriber, payments must be made on a semi-annual basis.

(h) An applicant subscriber who becomes a pensioner (of any pension plan maintained by his employer) while this contract is in effect may renew his contract on each renewal date, subject to the consent and approval of the corporation at such charges as are designated.

XI. GENERAL REGULATIONS

(a) Benefits under this contract are personal to the applicant subscriber or covered dependents and are in no way assignable, and the contract shall be forfeited without refund if either attempts to transfer it or attempts to aid any other person in obtaining benefits under it in a fraudulent manner.

(b) No person or persons other than an applicant subscriber or his dependent recorded in the office of the association is entitled to any benefits under this contract.

(c) The applicant subscriber, on the renewal of his subscriber's contract, shall have the privilege of withdrawing the name or names of any dependents or of adding the name or names of any qualified individual or individuals as dependents, upon the execution by the applicant subscriber of a supplemental application on forms furnished by the service association 30 days prior to the renewal date, except that the name of a newly born child or a newly married spouse may be added as a dependent by the applicant subscriber during the contract year, if added within 30 days after the birth of the newly born child or the marriage of the newly married spouse and by paying the additional charges therefor.

(d) If any child of the applicant subscriber shall marry or attain his nineteenth birthday, this contract shall terminate as to such child on the renewal date of this contract next succeeding.

XII. NOTICE

Any notice given hereunder shall be sufficient, if given by this corporation to the subscriber, when mailed, first-class postage prepaid, to the subscriber at the address as it appears on

the records of this corporation, and if given by the subscriber, when mailed to this corporation at its principal office in Fargo, North Dakota, postage prepaid.

XIII. ASSIGNMENT OF RECORDS

The applicant subscriber, on behalf of himself and each covered dependent, agrees that any physician who has made a diagnosis or treated him or covered dependent, for any condition for which service or indemnification is sought under this contract, or any nurse or hospital in possession of any information, records or copies of records relating to such diagnosis or treatment, may furnish and is authorized to furnish to this corporation at any time upon its request, to such extent as may be lawful, any and all information and records and copies of records relating to the diagnosis, treatment or service provided to the applicant subscriber or covered dependent before or after the execution of this contract, it being understood that this corporation shall be in the same position with regard to the aforesaid information and records as if this corporation were itself providing said surgical or other services. The corporation agrees that such information and reports relative to diagnosis and services given applicant subscriber or covered dependent shall remain confidential.

XIV. SUBROGATION

The applicant subscriber, on behalf of himself and each covered dependent under this physicians service contract, in consideration of the issuance of said contract, agrees that whenever he or his covered dependents shall have received benefits under the terms of this contract for injuries resulting from accident or from the negligent or unlawful act of third persons, the corporation, to the extent of such benefits furnished, shall be subrogated to the applicant subscriber's or covered dependent's rights to recover for loss or damage resulting from such injury to an amount equal to the value of the care and services furnished by this corporation to the applicant subscriber or covered dependent, and the treatment of such injuries, according to the rates and charges fixed by the corporation for participating physicians, which amount shall be paid to the corporation by the third person liable for the injury to the applicant subscriber or covered dependent, or by the applicant subscriber or covered dependent, if the applicant subscriber or covered dependent shall have collected any money for damages or compensation for injuries sustained as aforesaid.

Maternal and Child Welfare

Your committee on maternal and child welfare held a meeting on September 24, 1944, which was attended by the following members: Drs. Paul Freise, J. F. Hanna, John Graham, Lawrence G. Pray, M. D. Westley and John H. Moore. In addition, Dr. George F. Campana, state health officer, and Dr. F. G. Gunlaugson, director, division of maternal and child hygiene for the state department of health, were present and rendered invaluable assistance to the committee in its deliberations.

Dr. Gunlaugson was elected acting secretary of the committee. He presented numerous technical details regarding the EMIC program on which the Division of Maternal and Child Hygiene requested the advice of the committee. Since this EMIC plan covered some twenty pages and since your committee could detect no basic change in the philosophy of the Children's Bureau regarding the operation of the plan, no attempt will be made in this report to go into the changes that were recommended by the committee. The plan is on file in the division of maternal and child hygiene of the North Dakota state health department, where its technical details may be studied by any interested physician. It is significant to note, however, that your program is "for the duration of the war and not to exceed six months thereafter." We agreed with the state health department, that fees for surgery in connection with the EMIC program, but fees that were not included in the EMIC program as originally outlined, should be paid at the rate provided by the state public welfare board fee schedule and approved by the committee on medical economics of the North Dakota state medical association; but we also noted that a regulation of the children's bureau provides that no fee in excess of \$50.00 can be paid for surgery.

You will recall that our report for 1943 showed, graphically, that obstetric hemorrhage was the leading cause of maternal deaths in North Dakota that year and that we made certain

specific recommendations regarding its prevention and treatment. Through the courtesy of Mary Agnes Gordon, statistician for the division of vital statistics of the North Dakota state health department, we are happy to report that the provisional maternal death rate for 1944, which includes all 1944 maternal deaths, reported through February 1945, is 18 per 10,000 live births. There were fewer deaths from hemorrhage than in 1943, but there is still room for improvement.

It is too early to tell what effect the plasma bank program of the North Dakota state health department will have on deaths from obstetric hemorrhage but the following figures, supplied by the director of the division of laboratories, are of interest: since the distribution of plasma was started by the Grand Forks laboratory in the fall of 1944 and including April 1, 1945, North Dakota-made plasma has been used on 220 patients. Thirty-five of these were obstetric patients. Specific mention was made of ectopic pregnancy, placenta previa, postpartum hemorrhage, toxemia of pregnancy, difficult labor and hemorrhage from spontaneous abortion as cases in which the plasma had been used for obstetric indications, and if we include three patients who had had cesarean section and were listed under post-operative shock, the total is 38 obstetric patients to April 1, 1945, who have had the benefit of plasma. Your committee endorsed the blood plasma program of the North Dakota state department of health.

Considerable time was devoted to standards for prepurum care, and it was agreed that these should include: (1) Wassermann test, (2) hemoglobin determination, (3) complete physical examination (on initial visit to physician) with follow-up examination every month until the seventh month, and at least every two weeks thereafter until delivery, and (4) complete blood count and Rh factor determination in cases where transfusion was found necessary. It was also pointed out that the Rh factor should be determined where there have been previous neonatal deaths.

A discussion of future postgraduate courses for physicians in obstetrics and pediatrics was held and it was the recommendation of your committee that separate courses in obstetrics and pediatrics be held as soon as suitable arrangements can be made and that these courses emphasize, in obstetrics: (1) obstetric hemorrhage, (2) the prevention of premature labor, and (3) anesthesia, including the barbiturates. In pediatrics, your committee recommended emphasis on (1) care of the premature infant, and (2) care of the new-born during the neonatal period.

A sub-committee was appointed to assist with the classification of maternal and infant deaths after the division of maternal and child hygiene has gathered the anonymous case histories of these cases.

Infant mortality rates are showing improvement in North Dakota. The provisional rate for 1944 is 35 per 1,000 live births.

Recent outbreaks of diphtheria in North Dakota again focus attention upon the fact that immunization from this preventable disease is far from adequate. By the same token, immunization against smallpox and pertussis needs to be emphasized. We urge that an immunization program for infants under one year of life be encouraged by our North Dakota physicians along the lines recommended by modern pediatric practice and that physicians in private practice carry out this immunization program wherever and whenever possible.

From the foregoing, it must be evident that your committee has had the closest cooperation from the North Dakota state health department. There are many difficult problems in the field of maternal and child welfare which remain to be solved. In these crowded days, it is especially fortunate that we have a state health officer, Dr. George F. Campana, who understands the perplexing nature of those problems and who works so wholeheartedly with the medical profession in their attempted solution.

JOHN H. MOORE, M.D., *Chairman.*

Crippled Children

No problems have arisen in connection with the crippled children program of the state during the past year. At least, nothing has been brought to the attention of this committee and there have been no committee meetings.

A. R. SORENSEN, M.D., *Chairman.*

Venereal Diseases

A meeting of the committee was held in December 1944 at Jamestown, attended by four members of the committee and Dr. G. F. Campana, state health officer. The treatment of syphilis was discussed and no changes in the present regulation or control were advised—it being felt that this should be postponed until present opinions about the newer treatments have crystallized.

In the treatment of gonorrhea, it was recommended that provisions be made for penicillin treatment in sulfonamide resistant cases. In correspondence with the United States Public Health Service, however, it appears that these provisions shall have to await perfection of improved methods of penicillin administration without the necessity of hospitalization.

The committee will hold further meetings when further data are available.

JOSEPH SORKNESS, M.D., *Chairman.*

Pneumonia Control

At the meeting of the pneumonia committee of the North Dakota state medical association held at the state capitol, Sunday, February 11, 1945, the following members were present: Chairman, O. W. Johnson, M.D., Rugby; W. H. Gilsdorf, M.D., New England; L. H. Fredericks, M.D., Bismarck; and G. F. Campana, M.D., state health officer. Dr. Johnson presided at the meeting and the following resolutions were made:

1. It is recommended by the committee on pneumonia control that sulfathiazole, sulfadiazine, and sulfamerazine continue to be made available to doctors in the state. That these drugs be used first in pneumonia cases, and if after twenty-four hours the sulfa drugs produce no improvement, then penicillin be used; the individual doctor to judge when penicillin should or should not be used.

2. *Virus Pneumonia.* It is recommended that the usual treatment for an ordinary pneumonia be tried for forty-eight hours before using penicillin. The same to hold true in cases of atypical pneumonias.

3. *Empyema.* The recommended dosage for empyema is 250 to 300 units per cc. for chest irrigation. Irrigation to be repeated about every twelve hours.

4. *Pneumococcal pneumonia.* Dosage of penicillin for treatment of pneumonia suggested was from as little as 100,000 units dose for two days in pneumococcal pneumonia in uncomplicated cases, up to 200,000 to 400,000 units per dose for several days. The same treatment to be used for staphylococcal infections.

In many instances, large doses of penicillin are recommended in treatment of pneumonia in order to prevent the organisms from becoming penicillin-fast. In drug-fast strains or in cases of drug sensitivity, it is suggested that either serum and/or penicillin be used for treatment.

Type III pneumonia is best treated with sulfonamide drug and serum. Types VII and VIII the same as above but to a lesser degree. When using sulfonamide therapy the drugs of choice should be sulfadiazine, sulfathiazole, and sulfamerazine.

5. It is recommended that penicillin be stocked at depots with instructions that the hospitals may use it for other selected cases not coming under the pneumonia control program; this to be replaced with fresh stock as soon as possible after use at the expense of the one for whom it was used.

6. *X-ray service* to remain the same as before; namely that a maximum of \$15.00 be allowed for pneumonia x-rays on a single case. (A physician to be paid for a maximum of three films, with the privilege of taking more films at no cost to the program if he so desires.)

7. *Service on serum* to remain the same; namely, only types 1, 2, and 3 pneumonia anti-serum would be available at the typing stations. Other types are to be available at the public health laboratories located in Bismarck and Grand Forks, N. D.

8. The committee recommends that a circular be sent to all doctors in the state requesting better cooperation in reporting pneumonia cases to the state health department. All cases of pneumonia should be reported, regardless of whether they come under the pneumonia control program or not.

O. W. JOHNSON, M.D., *Chairman.*

REPORTS OF SPECIAL COMMITTEES

The following reports of the special committees were referred to the reference committee on reports of the president, secretary and special committees.

Industrial Health

Your committee on industrial health did not hold an official meeting during the past year, and the annual congress usually held in Chicago each February was postponed because of the federal ruling banning conventions.

Due to the stimulation received from the war effort, industrial health is certain to enter the post-war period in a strong and vigorous condition. Adequate medical service to industry, along with a better understanding and treatment of occupational disease and injury will be demanded both by labor and capital.

The type of medical service which has been developed by Henry Kaiser in his defense plants will be further developed and copied following the war, and will afford opportunities for those medical men who are especially interested in this special field.

C. J. GLASPEL, M.D., Chairman.

War Participation

A meeting of this committee was not held during the past year, because the work of the procurement and assignment service for physicians in North Dakota has been limited, mainly, to the preparation of reports on the distribution of physicians in the state. We were not required to furnish a quota of medical officers for the armed forces during 1944.

There are 59 North Dakota physicians in military service (including Red Cross). Of this number, 57 are members of our association.

The critical shortage of physicians in several localities in the state remains a major problem. Attempts to relocate physicians from other states to these areas, all of which are rural, have been unsuccessful. It remains to be seen whether or not the majority of our physicians who left rural communities to enter military service, will return to their former locations. If they do not, many of these critical areas will be in need of physicians. Surveys of the entire state have been made at the request of the procurement and assignment service and the American Medical Association in order that physicians who are discharged from the service may know where the best openings are located. It will remain the duty of the committee on war participation and the procurement and assignment service to insure adequate medical care for all of the citizens of the state as soon as possible.

MEDICAL MANPOWER SITUATION IN NORTH DAKOTA

Table No. 1 indicates the number of physicians in North Dakota. The total is 367, of which 328 are in active practice. Table No. 2 shows the age distribution of the 328 physicians who are in active practice. Two-thirds of them are 45 years of age or older, and fully one-fifth are over 65 years of age. It is obvious that a large number of young physicians will be needed to fill the ranks in the near future, because the majority of those now practicing who are 65 years of age or older will retire or markedly curtail their practices as soon as possible.

Table No. 3 contains an analysis of the "effective" physicians in North Dakota and the physician-population ratio. A physician under 65 years of age, who is in active practice, is considered effective, but those over 65 years of age are considered one-third effective. With this yardstick, North Dakota has only 280 effective physicians, and the physician-population ratio is 1 to 1917. This is less than the accepted ratio of 1 to 1500. A spot map showing the distribution of physicians in the state reveals that the problem is mainly that of distribution and not scarcity of physicians. Three counties in the state have a ratio of under 1000 citizens per active physician; one county has one active physician for 1000 to 1500 citizens; seventeen counties have one active physician for 1500 to 2000 citizens; seven counties have one active physician for 2000 to 2500 citizens; six counties have one active physician for each 2500 to 3000 citizens; sixteen counties have one active physician for 3000 or more citizens; and in three counties there is no physician (Slope, Billings and Oliver).

TABLE No. 1 <i>Number of physicians in North Dakota</i>		
Physicians in active practice (all ages)	328	
Non-effectives (age, disability, etc.)	22	
Medical school teachers	2	
Physicians in state hospitals and institutions	12	
Physicians in health departments	3	
Total	367	

TABLE No. 2 <i>Age analysis of private practitioners in North Dakota</i>		
Age Groups	Total Number	Percentage
Under 38 years	50	15.2
38 to 45	66	20.1
45 to 65	137	41.0
65 and over	71	21.7
Females	4	1.2
Total	328	100.0

TABLE No. 3 <i>Physician-Population Ratio</i>		
Number of physicians in full time practice		
under 65 years of age	255	
Effective physicians over 65 years of age ($\frac{1}{3}$ of 71)	24	
Number of part time physicians under 65 years		
of age ($\frac{1}{3}$ of 2)	1	
Total number of effective physicians	280	
Estimated civilian population, Nov. 1, 1943	536,610	
Physician-population ratio: 1 to 1917		

L. W. LARSON, M.D., Chairman.

Report of the Delegate to the American Medical Association

Dr. A. P. Nachtwey, delegate, submitted the following report, which was referred to the reference committee on reports of the council, councillors and delegate to the American Medical Association.

Your delegate to the American Medical Association begs leave to submit the following report:

The American Medical Association held its 95th annual session in Chicago, June 12th to 16th, 1944.

The wartime session of the American Medical Association was extraordinary, in that the attendance, in view of the difficulties of traveling and hotel accommodations, reached a total of 7,284.

The house of delegates devoted its session to consideration of problems that no doubt will have considerable bearing on the future of medical progress. The importance of maintaining an adequate medical supply of pre-medical students was emphasized to the nation and particularly to all interested government officials and to the appropriate committees on military affairs of both the House and Senate.

The functions of the council on medical service were more clearly defined, and more closely coordinated with the office of the council in Washington.

For the first time since your delegate has been attending the annual meetings, there was far from a unanimity of opinion of the delegates in regard to the management of the medical association and to its councils in Washington and to its contact with the association and to the public. Numerous resolutions were introduced bearing this out, particularly by the state of California. The resolutions were defeated, but in the opinion of your delegate, the majority was far from overwhelming.

The address of president Herman L. Kretschmer was pertinent to the existing wartime conditions and was well received. The president-elect, Dr. Roger I. Lee, was a happy choice, as through long years of service to organized medicine, he is fully qualified to carry on and guide the association through perilous times.

The special feature of this session was the military medical meeting, at which the surgeons general of the Army and of the Navy delivered an inspiring and informative address.

The remainder of the transactions of the business of the house of delegates was carried out in a harmonious manner, and as usual, the various reference committees performed their respective duties in their usual efficient manner.

The house of delegates adjourned sine die at 3 o'clock, June 16th, 1944. A. P. NACHTWEY, M.D., Delegate.

NEW BUSINESS Dues

The problem of employing a full time secretary, which would necessitate a material increase in the annual dues, was thoroughly discussed by the speaker, secretary, and delegates Wright, Hanna, Waldschmidt, Nachtwey, Williamson, McCannel and Wood. It was pointed out that a full time secretary would do much to improve our association as well as its component district societies, and would also improve our public relations.

Dr. Wright introduced the following amendment to the by-laws: "That chapter nine, section one, line one of the by-laws which reads 'the assessment of \$10.00 per capita,' be amended to read, 'the assessment of \$50.00 per capita'."

A motion was made by Dr. Wright that the speaker be authorized to appoint a special committee of three to consider the above amendment to the by-laws and report back to the house of delegates at the next session. The motion included the proviso that the secretary be a member of this committee. Motion was seconded by Dr. Waldschmidt and carried unanimously. The speaker appointed Drs. James F. Hanna, A. P. Nachtwey, and the secretary, as the members of this committee.

Nominating Committee

The secretary announced that President Wicks had appointed the following to the nominating committee: Drs. W. A. Wright, chairman, A. W. Macdonald, and C. V. Bateman.

Adjournment

The first session of the house of delegates was adjourned to reconvene at 8:30 P. M. on the same day, on motion made by Dr. Waldschmidt, seconded by Dr. Nachtwey and carried.

SECOND SESSION of the HOUSE OF DELEGATES

Sunday Evening, May 20, 1945

The second session of the house of delegates was called to order by the speaker, John Moore, at 8:35 P. M., in the private dining room of the Rudolph hotel, Valley City, N. D., May 20, 1945.

The secretary called the roll. Fourteen delegates responded, and the speaker declared a quorum present. The following delegates and alternates responded: Drs. G. Wilson Hunter, Fargo; O. A. Sedlak, Fargo; G. W. Toomey, Devils Lake; W. A. Liebeler, Grand Forks; G. M. Williamson, Grand Forks; W. A. Wright, Williston; A. R. Sorenson, Minot; C. V. Bateman, Wahpeton; C. J. Meredith, Valley City; R. H. Waldschmidt, Bismarck; W. H. Bodenstab, Bismarck; F. W. Fergusson, Kulm; M. J. Moore, New Rockford, and G. C. Christianson, Sharon.

The secretary read the minutes of the first session, which were approved as read.

Election of Officers

Dr. W. A. Wright, chairman of the nominating committee, presented the following report and moved its adoption. The speaker called for nominations from the floor. Hearing none, he declared that a motion would be in order to declare the nominees presented by the nominating committee duly elected to their respective offices. Dr. Hunter moved that the nominees be elected unanimously. The motion was seconded by Dr. Waldschmidt, and carried unanimously.

Doctors: James F. Hanna, president.

A. E. Spear, president-elect.

Phillip Arzt, first vice president.

W. A. Liebeler, second vice president.

John H. Moore, speaker.

W. W. Wood, treasurer.

L. W. Larson, secretary.

A. P. Nachtwey, delegate to the A.M.A., 1945.

W. A. Wright, alternate delegate to A.M.A., 1945.

A. D. McCannel, councillor, first district.

C. J. Meredith, councillor, fifth district.

A. E. Westervelt, councillor ninth district.

State Board of Medical Examiners (term three years): Drs. W. H. Long, F. W. Fergusson, O. W. Johnson.

Representative for the advisory committee on the University Medical Center (term three year): John H. Moore.

Selection of 1946 Meeting Place

The secretary announced that a formal invitation had not been received. Dr. Sorenson stated: "Minot would be very glad to entertain the association next year, provided the ODT will allow us to have the meeting." Motion was made by Dr. Liebeler that the 1946 meeting of the association be held in Minot. The motion was seconded by Dr. Fergusson and carried unanimously.

REPORTS OF REFERENCE COMMITTEES

Reference Committee to Consider the Reports of the President, Secretary and Special Committee

Dr. A. R. Sorenson, chairman, presented the following report which was adopted section by section and as a whole.

1. Report of the president: The report of the president is filled with thoughts well worthy of intensive study by every member of our association. It brings out clearly the changing trends of thoughts of health care and the fact that we must change our thinking to keep in tune with the times. We are no longer an isolated body, sufficient unto ourselves, but are gradually being incorporated into the new social order. If we are to maintain our identity we must think and act soon, lest we be engulfed in the wave of socialistic regimentation. Our president has shown us the path to pursue; let us heed him. This committee recommends a standing vote of thanks to President Wicks for his outstanding performance of duty.

2. Report of the secretary: The report of the secretary is as usual complete and edifying. How he found the time to perform his work so satisfactorily in addition to his other duties, is a marvel. However, we realize that it is asking too much of him, and would approve his recommendation as to a full time secretary. We also recommend that this association continue its support of the North Central Medical conference.

3. Report of the committee on war participation: The report of this committee on the medical manpower situation in North Dakota is illuminating and shows definitely the need of bringing in more and younger men to satisfy the medical requirements of this state. It is recommended that the booklet put out by the state committee on health planning be carefully studied. It is enlightening as to lay health care thinking and should teach us to profit by our real or supposed shortcomings.

4. Report of the committee on industrial health: I move that this report be adopted.

A. R. SORENSEN

O. T. BENSON

G. C. CHRISTIANSON

Reference Committee on Reports of the Council, Councillors and Delegate to the A.M.A.

Dr. G. Wilson Hunter, chairman, presented the following report, which was adopted section by section and as a whole on motion of Dr. Hunter, duly seconded and carried.

1. Report of the chairman of the council: Your reference committee recommends the adoption of the report of the council. We would like to emphasize the following points that have been named in this report:

a) The consideration of an increase in the annual dues in order that a full time secretary can be employed, is certainly in order.

b) Recognizing the diminishing number of physicians in North Dakota, we feel that every inducement should be made to get men with satisfactory training to come into the state.

c) We would like to draw your attention to the unanimous adoption by the council of the report of the tuberculosis committee regarding the use of a mobile unit. We feel that this is a very worthwhile project.

The committee commends the encouragement by the council of the steps to improve the medical school and wishes to recognize the work of Dean French throughout the years in this connection.

2. Reports of the councillors. Your reference committee recommends the adoption of the reports of the councillors and suggests that the members of the smaller societies who are unable to hold scientific meetings, continue to visit the meetings of the larger groups.

3. Report of the delegate to the American Medical Association: Your reference committee recommends the adoption of the report of the delegate to the American Medical Association. However, we would like to have Dr. Nachtwey elucidate the

paragraph of his report on the functions of the council on medical service. He mentioned that these functions were more clearly defined and more closely coordinated with the office of the council in Washington. We feel that the activities of this group might be more fully discussed for the delegates. (Dr. A. P. Nachtway, delegate to the American Medical Association, gave a resume of the establishment of the council on medical service and public relations of the American Medical Association, and its record to date. His remarks were amplified by the secretary.)

Reference Committee to Consider the Reports of Standing Committees

Dr. Waldschmidt, chairman, presented the following report, which was adopted section by section, and as a whole on motion by Dr. Waldschmidt, duly seconded and carried.

1. Committee on medical education: We recommend the adoption of the report of the committee on medical education and wish to commend the committee for its efforts to obtain funds for a new science building from the state legislature.

2. Committee on necrology and medical history: Your reference committee recommends the adoption of the report of the committee on necrology and medical history and wishes at this time to pay special commendation to the members of the committee for their excellent presentation. The committee regrets that such a lengthy report was necessary because so many of the society members passed away during the preceding year. The committee requests that the speaker of the house of delegates ask the members of the house to stand for a period of one minute in silent tribute to the memory of those members who are no longer with us. (Members of the house of delegates stood one minute in silent tribute.)

3. Committee on public policy and legislation: Your reference committee recommends the adoption of the report of the committee on public policy and legislation and approves the satisfactory manner in which the enabling act was passed by the senate and the house. The committee also notes that it carried the emergency clause and became a law when the governor signed the bill on February 8th.

4. Committee on tuberculosis: Your reference committee recommends the adoption of the report of the committee on tuberculosis and notes with a great deal of interest that a staff has been completed to carry out the screening of high schools and institutions of higher learning, and that the program will be expanded as rapidly as the facilities are available.

5. Committee on official publication: Your reference committee recommends the adoption of the report of the committee on official publication.

6. Committee on cancer: Your reference committee recommends the adoption of the report of the committee on cancer, and wishes to commend the committee for its excellent endeavor to raise funds for the eradication of cancer. Your committee is also very happy to report that thirty-six North Dakota physicians attended the special course in cancer at the Continuation Center in Minnesota during the first four days of February of this year.

7. Committee on fractures: Your reference committee recommends the adoption of the report of the committee on fractures.

8. Committee on maternal and child welfare: Your reference committee recommends the adoption of the report of the committee on maternal and child welfare, and wishes to commend the committee for its endeavor to further reduce the infant mortality rate. The infant mortality rates, according to the report, show improvement in North Dakota. The provisional rate for 1944 is 35 to 1000 live births. The committee also notes that a recent outbreak of diphtheria calls our attention to further work that is necessary in preventable diseases, especially in regard to immunization. We trust that these immunization clinics will be held.

9. Committee on crippled children: Your reference committee recommends the adoption of the report of the committee on crippled children.

10. Committee on venereal disease: Your reference committee recommends the adoption of the report of the committee on venereal disease.

11. Pneumonia control: Your reference committee recommends the adoption of the report of the committee on pneumonia control. It is gratifying to note that sulfadiazine, sulfathiazole, and sulfamerazine continue to be made available to the doctors in the state, and that after twenty-four hours if the sulfa drugs produce no improvement, that the individual doctor should judge when penicillin should or should not be used.

W. H. WALDSCHMIDT

O. A. SEDLAK

M. J. MOORE

Reference Committee Report of Committee on Medical Economics

Dr. P. H. Woutat, chairman, presented the following report and moved its adoption; the motion was seconded by Dr. Waldschmidt: "Your committee to consider the report of the committee on medical economics begs leave to submit the following report: The committee on medical economics is to be commended and thanked for their efforts during the past year.

Testimony received by your committee from many interested officers, members and delegates indicates certain pertinent facts.

The principle of prepaid medical insurance plans is favored by most members of the North Dakota State Medical association and by most of its component societies.

The approval and cooperation of the big majority of the physicians in the state would be necessary to the success of any such plan operated by the state medical association.

There is a decided difference of opinion among members of the state medical association as to the advisability of the state medical association sponsoring its own plan at this time. This difference of opinion is based on certain weaknesses in the proposed plan, chief of which are the following:

1. Many members feel that there is as yet insufficient experience with such plans in rural areas to warrant the state medical association in a state as sparsely settled as ours embarking on such a plan. Certain larger and more populous states have recently started such plans and their experience should be available to us in the near future. It is felt by many that experiences based on plans operating in industrial areas do not necessarily apply to our state.

2. The proposed plan makes no provision for catastrophic medical illness. Many members wonder if some feature might be added, perhaps on an indemnity basis, to partially cover such illness, thus making for more complete protection and a better policy for the insured.

3. It is felt by some members that any prepayment insurance plan probably tends to result in the transfer of considerable medical and surgical treatment from areas with no hospital facilities to areas where such facilities are available. This is likely to result in increased migration of physicians to areas with hospital facilities. Under present circumstances such migration would be detrimental to many areas already poorly supplied with medical services.

For the above and other reasons, your committee recommends as follows:

1. That the report of the committee on medical economics be not adopted.

2. That the house of delegates of the North Dakota State Medical association approve the principle of prepayment medical insurance plans.

3. That the North Dakota State Medical association increase its efforts to fully inform the physicians of the state regarding the various possibilities of such plans.

4. That the North Dakota State Medical association attempt to ascertain the probable public response to such a plan.

5. That the medical economics committee of the North Dakota State Medical association continue its study of such plans, paying particular attention to the working of plans now starting operation in other rural states, with a view to presenting a modification of the proposed plan to the state association."

P. H. WOUTAT, Chairman

J. F. HANNA

A. P. NACHTWEY

D. J. HALLIDAY

W. W. WOOD

DISCUSSION

DR. WOUTAT: As you probably all know, this report was written more for the public than it was for the members of the house of delegates. We attempted to say that we are not ready to put such a plan in operation. At the same time, we favor such a plan but want more experience. We hoped that there would be nothing in there, if it got into the hands of the public, that would put us in an unfavorable light. I do not know whether the whole thing should be released.

DR. WRIGHT: I do not mean to criticize, but I would say that the report is filled with pious platitudes. They say yes, and they say no. Let's have it definite. I also ask, Mr. Speaker, that the vote on this report be a tally vote from each district so we know just where we stand.

DR. M. J. MOORE: I think I will speak for the younger men, with all due respect to some of the older fellows: Something is going to happen whether we take on a program like this or not. Someone is going to beat us to it. It is the younger fellows who are going to suffer, not you older men. I think we all respect Dr. Wright's integrity. I think he has studied all these plans. I have the utmost confidence in his ability to draw up such a plan. I would be in favor of accepting it as he drew it up.

SPEAKER: Any further discussion? This is what we want. This is the most important matter before us this year.

DR. NACHTWEY: I want to say a word or two about this, because I was a member of the committee. As you know, we had an open meeting this afternoon. We spent all afternoon on it. This is not our own judgment. We appreciate the fact that the public relation phase that Dr. Wright stressed should be thought of. I do not agree with Dr. Wright when we damn this thing with faint praise. We are not doing this. The committee members were in entire accord that they did not want the medical association to go into the insurance business. I think we were all in accord with that. We took a lot of time to this after the meeting this afternoon. As Dr. Woutat said, this report was drafted not to the house of delegates, but it was drafted with the idea that it would be released to the press. The committee agreed that we are going to get something, possibly, although an argument was brought up, and I think it is tenable, that because of prosperous conditions, the farmers will not do anything about a plan. They have a lot of money and won't have anything to do with it. In hard times they will be hollering for it more. We are not kicking it out of the window entirely. We do, definitely, need more experience from other states in agricultural sections. The committee felt we would be in no hurry about it, but we are certainly not turning it down.

SPEAKER: Any further discussion?

DR. HUNTER: If you do not approve the report, you are turning down the plan. I do not understand the language of the reference committee report.

SPEAKER: We will ask the secretary to read again the recommendations of the committee; that is the conclusions. Perhaps Dr. Woutat should read this as it is in his writing. (The recommendations of the reference committee were re-read.)

DR. WRIGHT: I understand that in the No. 1 recommendation, the report be not adopted. The rest of it is entirely irrelevant and immaterial and just suggestions for the future.

SPEAKER: It has not been brought in, in that way. It was brought in as a combined report and not split into sections.

DR. WRIGHT: How can you vote on the whole thing?

SPEAKER: You can do that, or we can entertain an amendment to the motion that is before us. It could be amended to strike out certain clauses.

DR. WRIGHT: The essential vote is the first sentence.

DR. WOOD: Would it make it any better to have it "not adopted at this time"? I think this might clear it up. It does not mean we will not adopt it in the future, just that we will not adopt it at this time.

DR. WICKS: I was just wondering, in view of the second section, whether the first section is necessary, because we do go ahead and say that we agree to study it further. I would suggest that one counteracts the other. If this is a matter of public relations, I think the laity would attach more importance to the first clause. It could be said that the report of the committee is accepted with those reservations. I think it would be better then.

SECRETARY: Could I interject just this? At the end of the report of the committee on medical economics, just before the entire plan is given, we read, "The economics committee submits the following proposal to the house of delegates," and there are five proposals. I do not see how you can consider the report of the committee on medical economics in any other way than either accepting, rejecting temporarily, or completely rejecting it, because in those proposals it says, first, that a medical service corporation be organized in accordance with provision of house Bill No. 187. In other words, if you sidestep the issue, and accept the report and do not make it clear, where will we be? For instance, No. 5 states "that the house of delegates loan the corporation a sum of not less than \$5000 to cover expenses incurred in organization." I think we should take a stand on the acceptance of this report.

DR. HANNA: I think a tally was kept by Dr. Halliday this afternoon, and this report is the reaction of the entire house of delegates.

SPEAKER: May I remind you then, gentlemen, you have a motion before the house to adopt this report. Had Dr. Wright not requested it, I was going to ask for a roll call on this important question. I do not know whether that satisfies your request for a method of voting or not.

DR. WRIGHT: I would like to have it very thoroughly understood. I am asking this for my own information, as to how to conduct the affairs of this committee. I want to know definitely, is this yes, or no? What are you turning down? Are you turning down the entire thing we have presented here with all five recommendations in my report, or are you suggesting that maybe it is a good idea, but we have not the right stuff? I would like to have this very definite. As I understand the first part of that motion, you disapprove of every part of this proposal. If anyone votes in favor of the motion, they are voting to discard or reject every part of this report?

SPEAKER: That would be my interpretation.

DR. MOORE: If you vote Aye, you are turning down the entire report?

DR. WOOD: I do not believe the committee wishes it turned down completely.

SPEAKER: Do you make that as an amendment?

DR. WOOD: Yes, if the committee will accept that.

SPEAKER: Dr. Woutat, will you poll your committee and find out if they will accept the words "at this time"?

DR. WOUTAT: Yes. I want to imply that we do not accept it at this time, and if we accept it at some other time, it will be an entirely new report. The intent is to advise continued study with a view to approving the plan when we have more experience available. It is not an attempt to throw this out of the window. We think it should be more fully studied, and we do not think the association is ready to jump into it right now.

SPEAKER: Is there a second to Dr. Wood's amendment?

DR. MEREDITH: I second the amendment.

SPEAKER: Is there any discussion on the amendment?

DR. MOORE: I would like to have this read as amended.

SECRETARY: "That the report of the medical economics committee be not adopted at this time."

DR. WRIGHT: I do not think this adds anything to it.

DR. WALDSCHMIDT: It seems to me that the discussion we had this afternoon on the report of the committee on medical economics, indicated a desire of the delegates to keep this problem alive. The reports of the individual delegates indicated a favorable attitude toward some sort of a prepayment plan throughout the state. If the house of delegates deems it desirable in the future, a plan can be adopted which will be as good as the one proposed in this report, if not better. The Sixth district society voted to table the plan for further study, but had no idea of throwing it out entirely.

SPEAKER: Is there any further discussion?

DR. WRIGHT: The plan in this book is available at all times. All I want to know now is, do you approve it now, or don't you approve it now?

SPEAKER: It is my interpretation, that if the amendment is approved at this time, there would be further plans. Are you ready for the question on the amendment? I will ask the secretary then to read the amendment upon which you are now going to vote by record vote.

SECRETARY: The recommendation submitted is that the report of the medical economics committee be not adopted. The

amendment is to add the words "at this time" we are voting on the amendment.

Record Vote. Drs.: Hunter, No; Sedlak, No; Hanna, Yes; Toomey, Yes; Woutat, No; Williamson, Yes; Wright, Pass; Sorenson, Yes; Halliday, Yes; Bateman, No; Meredith, Yes; Waldschmidt, Yes; Bodenstab, Yes; Ferguson, Yes; Nachtwey, Yes; Wood, Yes; Moore, Pass; Christianson, No.

Dr. WILLIAMSON: Will you please explain this vote to me again?

SPEAKER: You are voting on the amendment that you are not adopting it at this time.

DR. WILLIAMSON: My vote is still Yes.

SECRETARY: Yes, 11; No, 5; Pass, 2.

SPEAKER: I declare the amendment passed. Are you ready for the question? Dr. Larson, will you read the recommendation with the amendment incorporated?

SECRETARY: For the above and other reasons, your committee recommends as follows:

1. That the report of the committee on medical economics be not adopted at this time.
2. That the house of delegates of the North Dakota State Medical association approve the principle of prepayment medical insurance plans.
3. That the North Dakota State Medical association increase its efforts to fully inform the physicians of the state regarding the various possibilities of such plans.
4. That the North Dakota State Medical association attempt to ascertain the probable public response to such a plan.
5. That the medical economics committee of the North Dakota State Medical association continue its study of such plans, paying particular attention to the working of plans now starting operation in other rural states, with a view to presenting a modification of the proposed plan to the state association.

SPEAKER: You are now going to vote, gentlemen, by roll call on the motion as amended. Will the same two tellers act at the conclusion of this vote? Will you call the roll, Mr. Secretary?

SECRETARY'S Record Vote: Drs.: Hunter, No; Sedlak, No; Hanna, Yes; Toomey, Yes; Woutat, Yes; Williamson, Yes; Wright, No; Sorenson, Yes; Halliday, Yes; Bateman, Yes; Meredith, Yes; Waldschmidt, Yes; Bodenstab, Yes; Ferguson, Yes; Nachtwey, Yes; Wood, Yes; Moore, No; Christianson, No.

SPEAKER: Will the tellers please announce the report of the vote?

DR. SORENSEN: The tabulation of the vote is correct.

SPEAKER: Mr. Secretary, will you please announce the vote?

SECRETARY: There were 13 Yes; 5, No.

SPEAKER: I declare the motion of the reference committee to consider the report of the committee on medical economics, as amended by the House, carried.

NEW BUSINESS

Amendment to By-Laws — Dues

The speaker called for a report of the special committee appointed at the first session to consider the amendment to Chapter 9, Section 1, Line 1, of the by-laws.

Secretary Larson, chairman of the committee, gave the following report, which was moved for adoption by Dr. Nachtwey, seconded by Dr. M. J. Moore, and carried unanimously: Your committee recommends that the amendment to Chapter Nine, Section One, Line One of the by-laws presented by Dr. Wright, and which reads "The assessment of \$50.00 per capita," be amended to read "The assessment of \$35.00 per capita."

DISCUSSION

SECRETARY LARSON: All the delegates seem agreed that we should have a full time secretary. If the budget I presented this morning is anywhere near correct, we will need a revenue of approximately \$10,000 per year to cover the expense of a full time secretary and the other expenses of the association. We do not know how many of our members who are now in the service and are not paying association dues, will return, or when they will return. It appears that about 300 paid memberships is the best we can expect until the service men return and until more physicians can be brought into the state. Divid-

ing \$10,000 by 300, we arrived at a figure of approximately \$35.00 per year per member. I might add, that in the opinion of the committee, the annual registration dues should be materially reduced.

Resolutions

Dr. W. H. Bodenstab, chairman of the committee on resolutions, presented the following report, which was adopted unanimously.

1. WHEREAS, the physicians of Valley City have contributed much to the success of the 1945 meeting of the house of delegates,

BE IT THEREFORE RESOLVED, that a vote of thanks be extended to the physicians of Valley City for their contribution.

2. WHEREAS, the City of Valley City and its Civic Commerce association has provided comfortable, suitable and adequate facilities for the 1945 meeting of the house of delegates,

BE IT THEREFORE RESOLVED, that a vote of thanks be extended to the city of Valley City and the Valley City Civic and Commerce association for the courtesies extended and the facilities provided.

W. H. BODENSTAB, *Chairman*,
W. A. WRIGHT
F. W. FERGUSON

Committee Authorized to Negotiate for a Full Time Secretary

After discussion, Dr. Wright moved that a special committee of three be appointed by the president to study the matter of engaging a full time secretary. The motion was seconded by Dr. Halliday and carried unanimously.

Adjournment

The house of delegates adjourned sine die at 10:00 P. M.

Installation of President

SPEAKER: I will ask at this time that Dr. Wicks and Dr. Woods escort the new president to the platform.

DR. WICKS: Greetings, Dr. Hanna. It seems to me that I have been waiting for this moment a very long time. I am sure you come well prepared for the administrative duties of the presidency. You are going to preside over a splendid group of individuals. I know you will have their full cooperation. I know you will also have a splendid administration. With my hand, goes the office and any honors pertaining thereto; my best wishes and my congratulations. Members of the association, our president, Dr. James F. Hanna.

DR. JAMES F. HANNA: Mr. Chairmen and members of the house of delegates. This is a historic meeting. Never before has the North Dakota state society been called upon to cancel its regular, planned scientific meeting to assist in a war effort. It is also historic for the decision you are about to make. I can think of no bigger decision to be asked of the house of delegates than the one asked of you—to favor or reject a program committing the profession of the state to a medical service plan. There are among you those that favor this plan, while others would reject it. Hearing each other's views and discussing them is the true democratic principle of arriving at a decision. Then when a decision is reached, to abide by the rule of the majority. We of the profession all look to you for your decision.

I, naturally, feel honored to be chosen president of the state society for the coming year. At the same time, I cannot but feel unprepared to carry on the work of the office during these times. I only hope I can represent you as well and as successfully as did Dr. Wicks during the past year. He has given freely of his time, appeared before various groups and they have profited by his counsel.

In the olden days when the office meant presiding at the scientific meeting, and meeting your old friends, it was a happier time. Let us hope that N-day of normalcy will soon be with us. Now all appointments require the acceptance of more responsibility and the giving of one's time. The chairmanship and membership of the various committees mean more responsibility.

I cannot help but admire the work of our economics committee, and the able leadership of the chairman, Dr. Willard Wright, during the past year.

We have our returning medical officers. They are deserving of much from us. Can our educational committee arrange post-graduate or refresher courses for them? Can our committee on

public policy and legislation see that they are given their just reward if the occasion should arise?

The recently enacted "Medical Center" law, which provides for a study of the need for a four year medical school course at the University of North Dakota calls for our enthusiastic support.

In closing, I would feel very ungrateful if I did not say a word of appreciation for the untiring effort and work of our secretary, Dr. Leonard Larson. I will need his counsel and I hope he will permit me to call upon him for assistance.

I shall endeavor to represent the state society to the best of my ability and trust the coming year will accomplish as much as the past year under the able guidance of Dr. Wicks.

SPEAKER: I want to say just one or two words to you, Dr. Hanna. I have been speaker of this house of delegates for five years. I have had a little experience with medical societies, national and local. I have never at any time met with a grander bunch of fellows than the house of delegates. As the speaker, I certainly pledge to you the fullest cooperation of the house of delegates.

DR. WILLIAMSON: I would suggest that Dr. Liebeler extend greetings from Grand Forks to our new president, Dr. Hanna.

DR. LIEBELER: It is a pleasure, Dr. Hanna, to greet you from the Grand Forks District medical society, and we offer all the help within us.

NORTH DAKOTA STATE MEDICAL ASSOCIATION ROSTER--1945

MEMBERSHIP BY DISTRICTS

CASS COUNTY MEDICAL SOCIETY

PRESIDENT	
Sedlak, O. A.	Fargo
SECRETARY-TREASURER	
Heilman, Charles	Fargo
Bacheller, Stephen	Enderlin
Baillie, W. F.	Fargo
Boerth, E. H.	Buffalo
Bond, J. H.	Fargo
Borland, V. G.	Fargo
Burt, A. C.	Fargo
Burton, P. H.	Fargo
Clark, I. D., Jr.	Fargo
Clay, A. J.	Fargo
Darner, C. B.	Fargo
Darrow, F. I.	Fargo
Darrow, K. E.	Fargo
DeCesare, F. A.	Fargo
Dillard, J. R.	Fargo
Elofson, C. E.	Fargo
Fjelde, J. H.	Fargo
Fortin, H. J.	Fargo

PRESIDENT	
Fox, W. R.	Rugby
SECRETARY-TREASURER	
Fawcett, J. C.	Devils Lake
Call, A. M.	Rugby
Clayman, Sidney G.	San Haven
Drew, G. F.	Devils Lake
Engesather, J. A. D.	Brocket

PRESIDENT	
Tompkins, C. R.	Grafton
SECRETARY	
Jensen, A. F.	Grand Forks
TREASURER	
Dailey, C. W.	Grand Forks
Alger, L. J.	Grand Forks
Bartle, J. P.	Langdon
Benson, T. Q.	Grand Forks
Benwell, H. D.	Grand Forks
Brown, G. F.	Grand Forks
Burrows, F. N.	Bathgate
Campbell, R. D.	Grand Forks
Canterbury, E. A.	Grand Forks
Caveny, K. P.	Langdon
Countryman, G. L.	Grafton
Countryman, John E.	Arch Cape, Ore.
Dailey, Walter C.	Grand Forks
Deason, F. W.	Grafton
Field, A. B.	Forest River

DEVILS LAKE MEDICAL SOCIETY

Fawcett, D. W.	Devils Lake
Fawcett, J. C.	Devils Lake
Fawcett, N. W.	Devils Lake
Fox, W. R.	Rugby
Graham, J. D.	Devils Lake
Greengard, M.	Rolla
Horsman, A. T.	Devils Lake
Hughes, B. J.	Rolla
Keller, E. T.	Rugby
MacDonald, J. A.	Cando

GRAND FORKS DISTRICT MEDICAL SOCIETY

Flaten, A. N.	Edinburgh
French, H. E.	Grand Forks
Glaspel, C. J.	Grafton
Glaspel, G. W.	Grafton
Goehl, R. O.	Grand Forks
Griffin, V. M.	Grand Forks
Grinnell, E. L.	Grand Forks
Haagensen, E. C.	Grand Forks
Hardy, N. A.	Minto
Haugen, C. O.	Larimore
Hetherington, J. E.	Grand Forks
Jensen, A. F.	Grand Forks
Kohlmeyer, F. C.	Lakota
Lamont, John G.	Grafton
Landry, L. H.	Walhalla
Leigh, R. E.	Grand Forks
Liebeler, W. A.	Grand Forks
Lohrbauer, L. T.	Grand Forks
Lommen, C. E.	Fordville
Mahowald, R. E.	Grand Forks
Moore, John H.	Grand Forks
Mulligan, V. A.	Langdon
Muus, O. H.	Grand Forks
Panek, A. F.	Milton
Peake, Margaret F.	Grand Forks
Quale, V. S.	Grand Forks
Rand, C. C.	Grafton
Ransom, H. R.	Grand Forks
Robertson, F. O.	Grand Forks
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Silverman, Louis	Grand Forks
St. Clair, R. T.	Northwoods
Stratte, J. J.	Grand Forks
Thorgrimson, G. G.	Grand Forks
Tompkins, C. R.	Grafton
Vance, R. W.	Grand Forks
Vollmer, F. J.	Grand Forks
Waldren, G. R.	Cavalier
Weed, F. E.	Park River
Welch, W. F.	Larimore
Waldren, H. M., Jr.	Grand Forks
Williamson, G. M.	Grand Forks
Witherstine, W. H.	Grand Forks
Woutat, P. H.	Grand Forks
Youngs, Nelson A.	Grand Forks

KOTANA DISTRICT MEDICAL SOCIETY

PRESIDENT			
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Craven, Joe D.	Williston	Craven, J. P.	Williston
Johnson, M. H. D.	Watford City	Johnson, P. O. C.	Watford City

SECRETARY-TREASURER			
Skovholt, H. T.	Williston	Jones, C. S.	Williston

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Nelson, Woodrow	Minot	Gammell, R. T.	Kenmare
Beck, Charles	Harvey	Garrison, M. W.	Minot
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Breslich, Paul	Minot	Goodman, R.	Powers Lake
Brunner, Harmon	Minot	Greene, E. E.	Westhope
Cameron, A. L.	Minot	Halliday, D. J.	Kenmare
Campbell, G. L.	Minot	Halverson, C. H.	Minot
Carr, A.	Minot	Halverson, H. D.	Minot
Carr, Andy M.	Minot	Hammargren, A. F.	Harvey
Craise, O. S.	Towner	Hanson, G. C.	Minot
Cronin, D. J.	Minot	Ittkin, Paul	Mohall
Devine, J. L., Jr.	Minot	Johnson, C. G.	Rugby
Devine, J. L., Sr.	Minot	Johnson, J. A.	Bottineau
Downing, W. M.	Minot	Johnson, O. W.	Rugby
Durnin, W. G.	Westhope	Kaufmann, Mark	Velva
Dyson, Ralph E.	Minot	Kermott, Henry	Minot
Erenfeld, F. R.	Minot	Kermott, L. H.	Minot
Erenfeld, H. M.	Minot	Knudson, K. O.	Glenburn
Flath, M. G.	Stanley	Kositsky, A.	Drake
		Lampert, M. T.	Minot
		* Lemieux, Darie	Rolla

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PRESIDENT			
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SECRETARY-TREASURER		Beithon, E. J.	Hankinson
Reiswig, A. H.	Wahpeton	Hoskins, J. H.	Wahpeton

SHEYENNE VALLEY MEDICAL SOCIETY

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SECRETARY-TREASURER		Brown, Fred	Valley City
Meredith, C. J.	Valley City	Cook, Paul T.	Valley City

SIXTH DISTRICT MEDICAL SOCIETY

PRESIDENT			
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SECRETARY-TREASURER		Driver, Donn R.	Bismarck
Pierce, W. B.	Bismarck	Fredricks, L. H.	Bismarck
Arneson, Charles A.	Bismarck	Freise, P. W.	Bismarck
Arnson, J. O.	Bismarck	Griebenow, Frederick	Bismarck
Baer, DeWitt	Steele	Gaebe, O. C.	New Salem
Barthell, J. H.	Hazen	Grorud, A. C.	Bismarck
Baumgartner, Carl	Bismarck	Heffron, M. M.	Bismarck
Benson, O. T.	Glen Ullin	Heinroth, G. E.	Turtle Lake
Berg, H. M.	Bismarck	Henderson, R. W.	Bismarck
Bertheau, H. J.	Linton	Hetzler, A. E.	Mandan
Bixby, Harriet Middletown, Conn.		Hill, F. J.	Minneapolis, Minn.
Bodenstab, W. H.	Bismarck	Jacobson, M. S.	Elgin
Brandes, H. A.	Bismarck	Larson, L. W.	Bismarck
Brandt, A. M.	Bismarck	LaRose, V. J.	Bismarck
Breslin, R. H.	Mandan	Leavitt, R. H.	Los Angeles, Calif.
Brink, N. O.	Bismarck	Linker, K. R. E.	Bismarck
Buckingham, T. W.	Bismarck	Lipp, G. R.	Bismarck
Campana, George	Bismarck	Monteith, George	Hazelton
Constans, G. M.	Bismarck	Moyer, L. B.	Bismarck
DeMouly, O. M.	Flasher	Nickerson, B. S.	Mandan
		Nuessle, Robert F.	Bismarck
		Orr, A. C.	Bismarck
		Owens, P. L.	Bismarck

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Meunier, H. J.	Oakes	Fergusson, V. D.	Edgeley

SOUTHWESTERN DISTRICT MEDICAL SOCIETY

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B'loedau, E. L. Bowman

Bowen, J. W. Dickinson

Chernausek, S. Dickinson

Dach, John L. Hettinger

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SECRETARY-TREASURER Larson, E. J. Jamestown

Arends, Archabald L. Jamestown

Arzt, P. G. Jamestown

Carpenter, G. S. Jamestown

PRESIDENT Knutson, O. A. Buxton

SECRETARY-TREASURER Vinje, Syver Hillsboro

PRESIDENT Ford, F. W. New Rockford

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Boyum, P. A. Harvey

Dukart, C. R. Richardson

Gilsdorf, A. R. Dickinson

Gilsdorf, W. H. New England

Guloen, Hans E. Dickinson

Gumper, A. J. Dickinson

Gumper, J. B. Belfield

Hill, S. W. Regent

Lyons, M. W. Minneapolis

Maerklein, O. C. Mott

Murray, K. M. Scranton

Nachtwey, A. P. Dickinson

Olesky, E. Mott

Reichert, H. L. Dickinson

Rodgers, R. W. Dickinson

Schumacher, N. W. Hettinger

Schumacher, Wm. Hettinger

Smith, O. S. Killdeer

Spear, A. E. Dickinson

STUTSMAN COUNTY MEDICAL SOCIETY

Christiansen, H. A. Jamestown

Culbert, M. H. Medina

DePuy, T. L. Jamestown

Fisher, A. M. Jamestown

Gerrish, W. A. Jamestown

Grangaard, H. O. Jamestown

Gronewald, Tula W. Jamestown

Holt, G. H. Jamestown

Larson, E. J. Jamestown

Longstreth, W. E. Kensal

Nierling, R. D. Jamestown

Peake, F. M. Jamestown

Rollefson, C. I. Jamestown

Roth, J. H. Jamestown

Sorkness, Joseph Jamestown

Stokes, G. P. Streeter

Wood, W. W. Jamestown

Woodward, F. O. Jamestown

TRAILL-STEELE MEDICAL SOCIETY

Christianson, G. C. Sharon

Cuthbert, W. H. Hillsboro

Dekker, Omar D. Finley

Kjelland, A. A. Hatton

Knutson, O. A. Buxton

LaFleur, H. A. Mayville

Little, R. C. Mayville

Savre, M. T. Northwood

Vinje, Syver Hillsboro

TRI-COUNTY MEDICAL SOCIETY

Donker, A. E. Carrington

Ford, F. W. New Rockford

Matthaei, D. W. Fessenden

Meadows, R. W. Carrington

Moore, M. J. New Rockford

Schwinghamer, E. J. New Rockford

Seibel, L. J. Harvey

Van de Erve, H. New Rockford

Westervelt, A. E. Bowdon

ROSTER North Dakota State Medical Association--1945

AbPlanalp, Ira S. Williston

Alger, L. J. Grand Forks

Almklov, L. Cooperstown

Arends, Archabald L. Jamestown

*Arneson, Charles A. Bismarck

Arnson, J. O. Bismarck

Arzt, Philip G. Jamestown

Baer, DeWitt Steele

Bacheller, Stephen Enderlin

Baillie, W. F. Fargo

Barthel, J. H. Hazen

Bartle, J. P. Langdon

Bateman, C. V. Wahpeton

Baumgartner, Carl Bismarck

*Beck, Charles Harvey

Beithon, E. J. Hankinson

Benson, O. T. Glen Ullin

Benson, T. Q. Grand Forks

Benwell, H. D. Grand Forks

Berg, H. M. Bismarck

Bertheau, H. J. Linton

Bixby, Harriet. Middletown, Conn.

Blatherwick, Wilfred D.

Van Hook Bowman

Bodenstab, W. H. Bismarck

Boerth, E. H. Buffalo

Bond, John H. Fargo

Borland, V. G. Fargo

Bowen, J. W. Dickinson

Boyum, P. A. Harvey

Brandes, H. A. Bismarck

Brandt, Albert M. Bismarck

Breslich, Paul J. Minot

Breslin, R. H. Mandan

Brink, Norvel O. Bismarck

Brown, Fred Valley City

*Brown, G. F. Grand Forks

Brunner, Harmon Minot

Buckingham, T. W. Bismarck

Burrows, F. N. Bathgate

*Burt, A. C. Fargo

Burton, Paul H. Fargo

Call, A. M. Rugby

Cameron, A. L. Minot

Campana, George Bismarck

Campbell, Garland L. Minot

Campbell, R. D. Grand Forks

*Canterbury, E. A. Grand Forks

Carpenter, G. S. Jamestown

Carr, Andy M. Minot

Carr, A. Minot

Caveny, K. P. Langdon

Chernausek, S. Dickinson

*Christiansen, H. A. Jamestown

Christianson, Gunder Sharon

*Clark, Ira D., Jr. Fargo

Clay, A. J. Fargo

Clayman, Sidney G. San Haven

Constans, G. M. Bismarck

*Cook, Paul T. Valley City

Countryman, G. L. Grafton

Countryman, John E.

Arch Cape, Ore.

Craise, O. S. Towner

Craven, Joe D. Williston

Craven, J. P. Williston

*Cronin, Donald J. Minot

Culbert, M. H. Medina

Cuthbert, W. H. Jamestown

Dach, John L. Hettinger

Dailey, Walter C. Grand Forks

*Darnar, C. B. Fargo

Darrow, Frank I. Fargo

Darrow, Kent E. Fargo

Deason, Frank W. Grafton

DeCesare, F. A. Fargo

Dekker, Omar D. Finley

DeMouly, Oliver M. Flasher

DePuy, T. L. Jamestown

*Devine, J. L., Jr. Minot

Devine, J. L., Sr. Minot

*Dillard, J. R. Fargo

Diven, W. L. Bismarck

*Dodds, G. A. Valley City

Dodd, Roberts K. Lisbon

Donker, Adrian E. Carrington

*Downing, W. M. Minot

Drew, G. F. Devils Lake

*Driver, Donn R. Bismarck

Dukart, C. R. Richardson

*Durnin, W. G. Bottineau

Dyson, Ralph E. Minot

*Elofson, Carl E. Fargo

Engesather, J. A. D. Brocket

Erenfeld, F. R. Minot

Erenfeld, Harris M. Minot

*Fawcett, D. W. Devils Lake

Fawcett, J. C. Devils Lake

Fawcett, N. W. Devils Lake

Ferguson, F. W. Kulm

Ferguson, V. D. Edgeley

Field, A. B. Forest River

Fjelde, J. H. Fargo

Flaten, A. N. Edinburgh

Flath, M. G. Stanley

*Fischer, V. J. Towner

Fisher, A. M. Jamestown

Ford, F. W. New Rockford

Fortin, Harry J. Fargo

*Fortney, A. C. Fargo

Foster, George C. Fargo

Fox, W. R. Rugby

Fredricks, L. H. Bismarck

Freise, P. W.	Bismarck	Kositsky, A.	Drake
French, H. E.	Grand Forks	LaFleur, H. A.	Mayville
*Fulton, A. M.	Minot	Lamont, J. G.	Grafton
Gaebe, O. C.	New Salem	Lampert, M. T.	Minot
Gammell, R. T.	Kenmare	Lancaster, W. E. G.	Fargo
*Garrison, M. W.	Minot	Landry, L. H.	Walhalla
*Geib, M. J.	West Fargo	Larson, E. J.	Jamestown
*Gerber, L. S.	Crosby	Larson, G. A.	Fargo
Gerrish, W. A.	Jamestown	Larson, L. W.	Bismarck
*Gilsdorf, A. R.	Dickinson	LaRose, Victor J.	Bismarck
Gilsdorf, W. H.	New England	Leavitt, R. H.	Los Angeles, Calif.
Glaspel, C. J.	Grafton	Leigh, R. E.	Grand Forks
Glaspel, G. W.	Grafton	*Lemieux, Darie	Rolla
Geohl, R. O.	Grand Forks	Lewis, T. H.	Fargo
Goodman, Robert	Powers Lake	Liebeler, W. A.	Grand Forks
Graham, J.	Devils Lake	Linker, K. R. E.	Bismarck
Grangaard, H. O.	Jamestown	Linsin, Ivan	LaMoure
Greene, E. E.	Westhope	Lipp, G. R.	Bismarck
*Greengard, M.	Rolla	Little, R. C.	Mayville
Griebenow, F. F.	Bismarck	Lohrbauer, L. T.	Grand Forks
*Griffin, V. M.	Grand Forks	Lommen, C. E.	Fordville
Grinnell, E. L.	Grand Forks	Long, W. H.	Fargo
Gronewald, T. W.	Jamestown	Longstreh, W. E.	Kensal
Gronvold, F. O.	Fargo	Lund, C. M.	Williston
Grud, A. C.	Bismarck	Lynde, Roy	Ellendale
Guloien, Hans E.	Dickinson	Lyons, M. W.	Minneapolis, Minn.
*Gumper, A. J.	Dickinson	Macdonald, A. C.	Valley City
Gumper, J. B.	Belfield	Macdonald, A. W.	Valley City
*Haagensen, E. C.	Grand Forks	Macdonald, J. A.	Cando
Halliday, D. J.	Kenmare	Maercklein, O. C.	Mott
Halverson, C. H.	Minot	*Mahowald, R. E.	Grand Forks
Halverson, Henry L.	Minot	Malvey, Kenneth	Bottineau
Hammargren, A. F.	Harvey	Matthaei, D. W.	Fessenden
Hanna, J. F.	Fargo	Mazur, B. A.	Fargo
Hanson, G. C.	Minot	McCannel, A. D.	Minot
Hardy, N. A.	Minto	McIntosh, G. J.	Devils Lake
Haugen, C. O.	Larimore	*McKeague, D. H.	Maddock
Haugen, H.	Fargo	Meadows, R. W.	Carrington
*Haugrud, E. M.	Fargo	Meredith, C. J.	Valley City
Hawn, Hugh W.	Fargo	Merrett, J. P.	Valley City
Heffron, M. M.	Bismarck	Meunier, H. J.	Oakes
Heilman, Charles O.	Fargo	Miller, H. H.	Wahpeton
Heinzeroth, G. E.	Turtle Lake	Miller, H. W.	Casselton
*Henderson, R. W.	Bismarck	*Miller, Samuel	Ellendale
Hendrickson, G.	Enderlin	*Mitchell, George	Milnor
Hetherington, J. E.	Grand Forks	Moffat, George	Crosby
Hetzler, A. E.	Mandan	Monteith, G.	Hazelton
Hill, F. J.	Minneapolis, Minn.	Moore, John H.	Grand Forks
Hill, S. W.	Regent	Moore, M. J.	New Rockford
Holt, George H.	Jamestown	Moreland, J. W.	Carpio
Horsman, A. T.	Devils Lake	Morris, A. C.	Fargo
*Hoskins, J. H.	Wahpeton	Moyer, L. B.	Bismarck
Hughes, B. J.	Rolla	Mulligan, V. A.	Langdon
Hunter, G. Wilson	Fargo	Murray, K. M.	Scranton
Huntley, H. B.	Kindred	Muus, O. H.	Grand Forks
Irvine, V. S.	Park River	Nachtwey, A. P.	Dickinson
Itkin, Paul	Mohall	Nelson, L. F.	Bottineau
*Ivers, G. W.	Fargo	Nelson, Woodrow	Minot
Jacobson, M. S.	Elgin	Nesse, S. A.	Nome
Jensen, A. F.	Grand Forks	Neve, H. E.	Minot
*Johnson, C. G.	Rugby	Nichols, A. A.	Fargo
Johnson, J. A.	Bottineau	Nichols, W. C.	Fargo
*Johnson, M. H. D.	Watford City	Nickerson, B. S.	Mandan
Johnson, O. W.	Rugby	*Nierling, R. D.	Jamestown
Johnson, P. O. C.	Watford City	*Nuessle, R. F.	Bismarck
Joistad, A. H.	Fargo	O'Brien, L. T.	Wahpeton
Jones, C. S.	Williston	Oftedal, Trygve	Fargo
Kaufmann, M. I. H.	Velva	Olesky, E.	Mott
Kellogg, I. W.	Fairmount	O'Neill, R. T.	Minot
*Keller, E. T.	Rugby	Orr, August C.	Bismarck
Kermott, Henry	Minot	Ostfield, J. R.	Fargo
Kjelland, A. A.	Minot	Owens, P. L.	Bismarck
Klein, A. L.	Minot	Palmer, Dolson	Cando
Knudson, K. O.	Glenburn	Panek, A. F.	Milton
Knutson, O. A.	Buxton	Parnall, E.	Minot
Kohlmeyer, F. C.	Lakota	Patterson, T. C.	Lisbon
Korwin, J. J.	Williston	Peake, F. M.	Jamestown
		Peake, M. F.	Grand Forks
		Perrin, E. D.	Bismarck
		Pierce, W. B.	Bismarck
		Pray, L. G.	Fargo
		Quain, E. P.	Eugene, Ore.
		Quain, Fannie D.	Bismarck
		Quale, V. S.	Grand Forks
		*Radl, Robert B.	Bismarck
		Ramstad, N. O.	Bismarck
		Rand, C. C.	Grafton
		Ransom, E. M.	Minot
		*Ransom, H. R.	Grand Forks
		Ray, R. H.	Garrison
		Reed, Paul	Rolette
		Reichert, H. L.	Dickinson
		Reiswig, A. H.	Wahpeton
		Rice, Paul F.	Solen
		Richter, E. H.	Hunter
		Roan, M. W.	Bismarck
		Robertson, F. O.	Grand Forks
		Rodgers, R. W.	Dickinson
		Rollefson, C. I.	Jamestown
		Rosenberger, H. P.	Bismarck
		Rostel, Hugo	Fargo
		*Roth, J. H.	Jamestown
		Rowe, P. H.	Minot
		Ruud, H. O.	Grand Forks
		Ruud, M. B.	Grand Forks
		Salomone, E. J.	Elgin
		Sand, O.	Fargo
		Savre, M. T.	Northwood
		*Schatz, G.	Fargo
		Schoregg, C. W.	Bismarck
		Schumacher, N. W.	Hettinger
		Schumacher, Wm.	Hettinger
		Schwinghamer, E. J.	New Rockford
		Sedlak, O. A.	Fargo
		Seibel, L. J.	Harvey
		Seiffert, G. S.	Minot
		Sihler, W. F.	Devils Lake
		*Silverman, Louis	Grand Forks
		*Sinner, B. L.	Fargo
		Skelsey, A. W.	Fargo
		Skovholt, H. T.	Williston
		Smith, C. C.	Mandan
		Smith, Clinton	Devils Lake
		Smith, J. A.	Minot
		Smith, O. S.	Killdeer
		Sorenson, A. R.	Minot
		Sorkness, J.	Jamestown
		Soules, M. E.	Dickinson
		Spear, A. E.	Dickinson
		Spielman, G. H.	Mandan
		St. Clair, R. T.	Northwood
		Stafne, W. A.	Fargo
		Stickelberger, J. S.	Oberon
		Stokes, G. P.	Streeter
		Stolinsky, A.	Boise, Idaho
		*Stone, Oral H., Jr.	Bottineau
		Stratte, J. J.	Grand Forks
		Strauss, F. B.	Bismarck
		Swanson, J. C.	Fargo
		*Swingle, A. J.	Mandan
		Tainter, Rolfe	Fargo
		Thompson, A. M.	Wahpeton
		Thorgimson, G. G.	Grand Forks
		Timm, J. F.	Makoti
		Toomey, G. W.	Devils Lake
		Tompkins, C. R.	Grafton
		Tronnes, Nels	Fargo
		Urenn, B. M.	Fargo
		Vance, R. W.	Grand Forks
		Van de Erve, H.	Carrington
		Van Houten, J.	Valley City
		Van Houten, R. W.	Oakes
		Veitch, Abner	Wahpeton
		Vigeland, J. B.	Brinsmade
		*Vinje, Ralph	Beulah

Vinje, E. G.	Beulah
Vinje, Syver	Hillsboro
*Vollmer, F. J.	Grand Forks
Vonnegut, F. F.	Linton
Waldren, G. R.	Cavalier
Waldren, H. M., Jr.	Drayton
Waldschmidt, R. H.	Bismarck
Wall, W. W.	Minot
Wallbank, W. L.	San Haven
Watson, E. M.	Fargo
Weed, F. E.	Park River

★In Military Service

*Deceased

★Weible, Ralph D.	Fargo
Welch, W. F.	Larimore
Westervelt, A. E.	Bowdon
Westley, M. D.	Cooperstown
Weyrens, P. J.	Hebron
Wheeler, H. A.	Mandan
Wheelon, F. E.	Minot
White, R. G.	Minot
Wicks, F. L.	Valley City
Williams, M.	New York City
★Williams, M. F.	Hettinger
Williamson, G. M.	Grand Forks

Winn, W. R.	Fargo
Witherstine, W. H.	Grand Forks
Wold, M. D.	Maddock
Wolfe, F. E.	Oakes
Wood, W. W.	Jamestown
Woodhull, R. B.	Minot
Woodward, F. O.	Jamestown
Woutat, P. H.	Grand Forks
Wright, W. A.	Williston
Yeomans, T. N.	Minot
Youngs, N. A.	Grand Forks

PRESIDENTIAL ADDRESS***Dr. F. L. Wicks****Valley City, North Dakota**

Members of the North Dakota State Medical Association:

During the past year it has always been in my memory that, but for an act of Providence, your presiding officer would have been Dr. A. O. Arneson of McVille.

Here was a man fittingly recognized by his colleagues for his great contribution to the welfare of his profession.

He was a man of high professional attainments; a legislator of integrity; held in the highest esteem by his constituents and elected to office by the votes of very many of unlike political faith.

It has been my privilege to talk to many of his former patients and several remarked that "you were half well when he entered your sick-room." Here then was a man of scientific medicine who had not neglected to practice also, the art of medicine.

Dr. Arneson would have brought to the office great wisdom and splendid leadership, so greatly needed in these strenuous times for our profession.

No apology is made for devoting some time to elementary things: to affairs pertaining largely to our own state; to public relations, and a few suggestions.

All members of the profession may well take pride in the glorious chapter of medical history now being written by their colleagues on both the home and war fronts. All are familiar with pertinent statistics.

Those at home, though diminished in numbers, have made a full and splendid contribution to the health care of the nation.

Those in service have established records never before equalled. The men who made these records were in most cases civilian practitioners or recent graduates, and the records are due not only to new drugs and new methods, but primarily to the ability, plus service training, of civilian doctors who volunteered for the need of their country.

In speaking of local conditions, it is not my intent to expand on the work of the committees of our association. They will make their own reports, and it is my suggestion that such reports be studied carefully. Committeemen do much valuable work for our profession, and they deserve much more gratitude than is usually given them.

*Presented before the North Dakota State Medical Association, Sunday, May 20, 1945.

The Governor's Health Planning committee: Last July 27th Governor Moses called together representatives of a large number of agencies to discuss health conditions in the state. Such action had been suggested in the article "The Need of Post-War Planning for Health and Medical Service in North Dakota" written some months previously by a representative of the Farm Foundation.

From the ranks of this group he then appointed members of a committee to be known as the State Health Planning committee. With its later additions the committee represents a fair cross-section of the population of the state.

Representatives of the following various organizations, associations, bodies and groups now hold memberships on the committee: State Hospital association, Catholic hospital and rural educational groups, State Medical association, State Dental association, State Nurses association, State Health department, Farmers Union, Farm Bureau, Parent-Teachers association, State Federation of Labor, State Department of Public Welfare, University Medical school, Farm Security administration, the State Post-War Planning board, the Legislature, the North Dakota Educational association, and the Pharmaceutical association.

Mr. Haslerud, director of extension service at the State College, is chairman of the committee, and Mrs. Ingram was loaned to us by the Farm Foundation for the purpose of making a survey, and organizational and educational work. Both have given outstanding service in their respective capacities.

The purpose of the committee as stated by Governor Moses was to study health conditions, especially those of rural districts, to see if they could be bettered, and if they could be bettered to recommend what could be done toward that end.

This committee is an alert and intelligent group. The lay members have had plenty of experience in the discussion of health needs in their own organizations. Some of the members have, no doubt, known more about the contemplated plans of procedure than have the rest of us.

They are aware of the many unsanitary conditions on the farm; they are interested in the elevation of health standards; they favor health units, and would wish to see more of these established. They know that these

improvements take time, and therefore appreciate the urgent need to start on them as early as possible. They do not want doctors regimented. They would work for better facilities for medical practice in the smaller communities, and would like medical help closer at hand. They have not complained about the fees of physicians and have been concerned with the economic side of the picture only insofar as to urge that since we may all anticipate poor times again in the future we should now be planning for the aid necessary in such times. They feel that if federal aid is available we should, at least, be willing to receive and welcome it.

They realize that education and more education will be necessary and is indeed paramount if their constituents are to appreciate the value of health or to know the value of insurance as related to prepayment plans.

Although they of the committee and we of medicine have about the same goal regarding medical care, they would be willing to put any amount of heat under the profession if it would bring the desired result, and for this I would not blame them if by that means we could be assured of getting what all of us want. Unfortunately, perhaps, that method is not the solution.

Medical responses to their problems are not particularly popular with them because we cannot furnish at once more doctors and better facilities, and a satisfactory solution is therefore not forthcoming through us. They know full well the uneven distribution of physicians in our state. They would like to see this corrected. Like all lay groups, they may be offered poor advice, which may be accepted in all sincerity but prove to be of no particular advantage to them. Let us remember, however, that all lay groups hear more from politicians and agitators than from medical men.

The bill for licensure of hospitals was sponsored by the committee. The committee is vitally interested in any health legislation and ordered a letter of commendation sent to our association because of our action in bringing enabling legislation before the legislature.

The committee voted support for measures looking to the expansion of the University medical school.

A number of meetings have now been held. Medical opinions have been frankly expressed. Health statistics of our state, with comparison to those of other areas of the nation, have been submitted to the committee. The committee advises health planning committees for the counties of the state.

It would appear that the views of this committee represent fairly well the attitude of the laity in general toward medical care and the medical profession. It would be gratifying if it could be truthfully stated that the reputation of our profession were better than it is. It can be improved.

Hopeful signs for the future: All of us, doctors and public alike, are interested in anything which may offer a more optimistic perspective of medical care for the future. Hopeful indications are:

The return of our men from the services to their former or to other fields of practice within the state.

The fine spirit of co-operation between the Public Health department and the profession.

The possible procurement of equipment, including ambulances, in the post-war period.

The blood-plasma program as carried on by the public health laboratories, under the direction of Mr. Koons.

The proposed mobile tuberculosis x-ray unit sponsored by Dr. Campana of the Public Health department, Dr. Arnson, chairman of our committee on tuberculosis, and the state anti-tuberculosis association.

With more medical and technical personnel, the establishment of other public health units.

The eventual operation of a state medical service plan, as presented by our committee on economics, headed by Dr. Wright, and looking toward the softening of the expense-blow associated with catastrophic illnesses.

A more expansive program of education of the laity through proper medical sources and the public health department. (The public must be brought to realize that personal health is an individual responsibility. Each has the obligation, in his own best interests, to present himself for examination while doctors still have a chance to do their best for him.)

Refresher courses for those on the home front, and more extended graduate courses for those returning from the services.

The possible removal of restrictions regarding the number of doctors trained by hospitals, and the allowance through selective service for a greater number of high-type students to enter medical schools.

The benefits for those wishing to study medicine through the G. I. bill of rights.

The possible expansion of the state university's medical school, educating North Dakota students in North Dakota, where they are more likely to locate.

The greater availability of penicillin and a host of other compounds and drugs now in the hands of research departments that by cutting short many illnesses will thereby reduce the incidence of hospital bed occupancy.

These are only some of the possibilities which offer hope for the future. To these can be added the greatest factor—the ever-growing desire of medical practitioners, regardless of reports to the contrary, to bring to their patients the very best medical care of which they are capable, and at the least possible expense.

Public Relations: Our profession has been challenged on many fronts, the past few years. Court proceedings against us and bills on medical care, presented by politicians, alone have done at least some harm to the reputation of the profession.

The answers which doctors offer appear in medical magazines and do not get the attention of the laity. The time is long overdue when medical opinions should be brought more directly to the public.

Some may feel that bills such as the Wagner-Murray-Dingel bill are dead, but one has only to study the bills presented before state legislatures, notably California's, to realize that this is no time for relaxation. Similar bills will again be presented, with delusive changes perhaps, but having the same deadly import for medical practitioners.

When the people at large hear of medical plans sponsored by politicians and brought forward by recognized

leaders, they are inclined to believe that at last someone is working for their best interests. If they hear from doctors at all it is usually in opposition to such plans and only rarely do they get information as to just why doctors are opposed or why they take the positions they do.

If all doctors became vocal their combined voices would perhaps be weak compared to those of leaders who claim to represent the laity. While keeping the public informed of reasons for their opinions and actions, doctors must concentrate their efforts on legislators, both state and federal, on those whose votes make laws. Therefore an improvement in the reputation of the profession with the public is vital.

People at large appreciate anything which doctors do to provide them with high-type medical services. It is my belief that the public wishes to permit doctors to deliver their highest grade of medical care, and will not stand for too much interference if fully acquainted with facts. Medical men, by a firm and united stand, must prove to politicians, however, that control of our profession will not be allowed to pass to them.

It seems to me that the public could be respectfully asked to consider some of the following points, advanced not only as a right of the medical profession but also as an obligation:

Over 60,000 of our most active members are now in the armed forces of our country. We at home have an obligation to these men away—to keep their profession, insofar as possible, as they knew it when they left for service. The men at war have nearly no opportunity at all to help formulate medical viewpoints on medical problems of national scope. In fairness they should have a voice in making decisions for the profession—should they not?

Politics and good medicine do not mix—they are incompatible. Plans which make for good politics may make for decidedly poor medicine. The public could be informed and legislators warned that it takes more than good equipment to deliver good medicine.

If private initiative and freedom of enterprise is even partially eliminated, much of professional value to the patient is destroyed. Under regimentation of doctors the quality of medical care will be poorer. The employer of the doctor must remain the patient, not the government. When doctors are regimented, so is the public.

Doctors must fight plans which they believe to be against the interest of their patients or be remiss in their duties to the public.

It might be remembered that doctors, like farmers and possessors of risk money, are great gamblers and will gladly take their chances in the future as in the past, on poor crops, poor wages, and poor pay patients, and really prefer it that way.

Much is heard regarding the holding of bonds for the later purchase of commodities, but very little is heard from anyone about reserving a few bonds for a health rainy-day.

The public could well be reminded of the many programs on which doctors already work,—at sub-standard fees. The public should know that unreasonable demands break down, rather than support, the efforts of

doctors. The laity might be asked:

a) Is it wise to discard something proven to be the best, in order to take up something which others have found poor?

b) Is it not strange that doctors have done so well in the interest of the public with a plan so inadequate that a few politicians, without aid of medical advice, can devise one so much better, and in short order?

c) Why should anyone believe that the same doctors, if employed by the government, would give better service than they do while on their own and with their own reputations to sustain in the various communities?

d) Doctors are busier than ever—is this then the time to add the burden of extra desk work demanded by multitudinous blanks and reports?

The individual could well be told—insist that your doctor keeps his identity and you have the best chance of keeping yours, and of surviving longer. After all, doctors—not politicians—are called when a man is sick.

In the usual expense of extended illness the cost of hospitalization, nursing and diagnostic procedures are all said to be greater than the fees paid to doctors. Doctors, however, are asked to do something about this—and we are making the fastest progress possible.

There are already plenty of insurance plans available to care for the major expenses, hospitalization and nursing.

That there is a shortage of doctors, everyone knows, and most plans contemplated by politicians would need more doctors in their operation than are required by the present system of practice.

The patient should be most anxious to keep his doctor responsible directly to him, rather than to some bureau in Washington.

Instead of worrying too much about the present value of medical care it might be more appropriate to worry about the type of medical care which would likely come as a result of the regimentation of medical practitioners.

A course whereby the laity is unhampered in the choice of physicians, doctors left in possession of self respect and in control of their own profession, presents now as formerly all the essentials for the greatest good for the greatest number.

North Dakota physicians will in no manner side-step their responsibilities in providing the best health care for our citizenry.

Finally, might it not be of value to all of us of medicine, in the field of public relations, to strive toward that goal upheld by the Nestor of medicine, Sir William Osler, when he said: "I have three ideals. One, to do the day's work well and not to bother about tomorrow. The second ideal has been to act the Golden Rule, as far as in me lay, toward my professional brethren and toward the patients committed to my care. And the third has been to cultivate such a measure of equanimity as would enable me to bear success with humility, the affection of my friends without pride, and to be ready when the day of sorrow and grief came, to meet it with the courage befitting a man."

Suggestions: Secretary Larson has done splendidly in keeping the profession informed of current events and

trends through his news letter, sent periodically to the entire membership of our society. These should be continued.

Likewise it is my belief that lay individuals should be kept informed of suitable medical ideas and ideals through public print and radio, as frequently as found desirable. The public hears about our profession too little from its practitioners. Such publicity should come from official offices, or committees of the state association, and would be a helpful supplement to educational material sent out by our health department. A thoroughly informed public would soon respond with proper respect for medical affairs and opinions.

All agencies, associations and organizations which are with us in the fight to maintain freedom of enterprise in medical practice should have our full support.

Thought might be given to the advisability of encouragement in the formation of a women's medical auxiliary. Such bodies have national programs in their own rights, and it would seem, could be beneficial in public relations, and especially in the physical fitness program, of which much will be heard in the future.

A lessening of the burden on our overworked secretary is necessary. All members realize that Dr. Larson possesses exceptional ability for this office. Most of us know that this ability operates in all instances where the association is concerned. Only those who serve as president know, however, of the great amount of work which must receive his attention. This means much sacrifice to personal interests. As the equation now stands, I am sure we are much in his debt. We cannot reasonably expect long continuance of the present status. A serious study of means to alleviate this situation is suggested.

It is essential that the fine spirit of fraternity existing among the members of our association continue, with the integration of service doctors back into civilian practice.

All support possible should be given to the public health department, the anti-tuberculosis association, the American cancer society, and other like groups.

It should be brought to the attention of the councilors, officers and past officers, that they could help much in the work of the house of delegates by attending its meetings. They have the privilege of the floor at the present time. Councillors serve for three years and most of them for many more. Many are regular attendants. It is suggested that a study be made of possible ways of stimulating a greater attendance by these experienced men.

May I express my appreciation, on behalf of the association, for the valuable work of the other officers, our efficient secretary, Dr. Larson; our treasurer, Dr. Wood; chairman of the council, Dr. Ramstad; the speaker of the house of delegates, Dr. Moore; councillors and delegates; the committeemen; and not forgetting the rank and file of the membership of our association, who truly represent the profession and therefore share in its leadership.

Now, my sincere personal thanks for the privilege of serving the association during the year. Thank you for your indulgence.

Book Reviews

Clinical Lectures on the Gallbladder and Bile Ducts, by SAMUEL WEISS, M.D., F.A.C.P., clinical professor of gastroenterology, New York Polyclinic medical school and hospital; gastroenterologist, Jewish Memorial hospital, New York; consulting gastroenterologist, Beth David hospital, Long Beach hospital, etc., with contributions by ERNEST E. SMITH and HARRY M. EBERHARD. Chicago: The Year Book Publishers, Inc., 504 pages with 125 illustrations, 1944, \$5.50.

This volume is the result of a vast clinical experience and many years of graduate teaching. It presents in a very readable and well-organized manner a practical guide to the diagnosis and treatment of biliary tract disorders. The relationship of biliary tract disease to the other body systems is emphasized. The clinical, laboratory and radiographic phases in diagnosis of gallbladder and bile duct disturbance are thoroughly described and correlated for intelligent use by the practitioner. The chapters on medical management are on pre- and postoperative care suggest therapy which can be adapted to individual case variation and which relies on the judgment of the physician for whatever treatment is indicated.

This book should be of value to the general practitioner and surgeon, and to medical men interested in the roentgenographic and laboratory aspects of biliary tract disease.

Essentials of Body Mechanics in Health and Disease, by JOEL E. GOLDFTHWAITE, M.D., LLOYD T. BROWN, M.D., LORING T. SWAIN, M.D., and JOHN G. KUHNS, M.D. Philadelphia: J. B. Lippincott Co., 337 pages, 1945, \$5.00.

This is the fourth edition of a book first published under the title of *Body Mechanics in Health and Disease*. The revised edition places more emphasis than the former editions on the prevention rather than the treatment of deformities due to faulty body mechanics and on the maintenance of physical fitness and health.

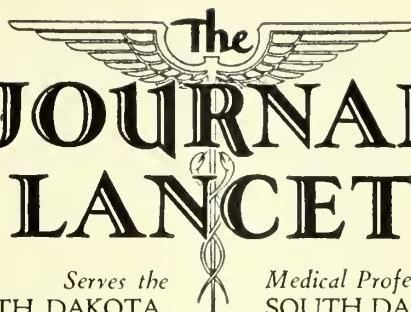
The first part of the book describes the various body types and the physiological differences found between the slender and the stocky types of individuals. The authors urge a broader understanding of anatomical and functional variations as a basis for evaluating pathological processes in any individual patient.

The section on body mechanics *per se* is an excellent discussion, well illustrated with diagrams and x-ray photographs, of the manner in which the mechanical use of the body may affect the functioning of all of the organs of the body. The major portion of the book discusses diseases of the circulatory, gastrointestinal and nervous systems and the relationship of poor body mechanics to these disease conditions. The chapter on backache, one of the common complaints of many patients, should be extremely helpful to the physician in his attempt to determine the cause of the backache when due to faulty body mechanics.

Another chapter gives emphasis to geriatrics and the aging process in relation to the mechanics of the body. It should be of great interest, with the increasing age of the population and the necessity for a better understanding not only of the normal changes but also the pathological, which take place in the aging process.

The section devoted to the treatment of faulty body mechanics is well done. The exercises given are clear, well illustrated and should be very useful to every physician. There is a very helpful chapter on the mechanics of the foot with suggested exercises to overcome the more common faults.

Unquestionably there will not be complete acceptance of the relationship of faulty body mechanics to certain diseases such as hypertension and angina pectoris until such time as more scientific evidence supports this idea. One gets the impression that the authors are somewhat over-optimistic in some of their statements. However, the book as a whole is well written, well illustrated and a real contribution in its field. Little is taught in the ordinary textbook of medicine of the importance of proper functioning of the skeletal and muscular systems to health. For that reason this book is one which should supplement the medical texts in the library of every physician.



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Official Journal of the American Student Health Assn., Great Northern Railway Surgeons' Assn., Minneapolis Academy of Medicine, Montana State Medical Assn., North Dakota Society of Obstetrics and Gynecology, North Dakota State Medical Assn., Northwestern Pediatric Society, Sioux Valley Medical Assn., South Dakota Public Health Assn., South Dakota State Medical Assn.

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MINNEAPOLIS, MINNESOTA, AUGUST, 1945

SISTER KENNY—FIVE YEARS AFTER

In another place in this issue the JOURNAL-LANCET publishes a report on five years experience with the treatment of infantile paralysis under the personal supervision of Miss Elizabeth Kenny. Unfortunately very few objective data are given in this paper, but it does include figures for mortality rates and for severe residual paralysis, as well as some other valuable information. The author of the paper, Dr. John F. Pohl, has been intimately concerned with the work of the Kenny Institute as its principal orthopedist.

Miss Kenny treated 364 patients during the period 1940 to 1944. Of these, 23 died while under her care, a significant mortality-rate that has not been emphasized by Sister Kenny. Dr. Pohl says regarding the fatality rate that a little more than half of the fatal cases were placed in a respirator before death, and further that "no patient survived being placed in the respirator." It may fairly be questioned whether the Kenny patients may not

have been nearly moribund before the respirator was employed. No data are provided on the point.

Dr. Pohl states that of the 341 patients surviving, sixteen per cent or 55 have "extensive residual paralysis." Thus it is admitted that twenty-two per cent of Miss Kenny's patients died or were extensively paralyzed. This is an account slightly different from that which one reads in the newspapers. Dr. Pohl has, in describing some of the results of the Kenny treatment, unwittingly perhaps, performed a real service to humanity in exposing these figures to public view. There is nothing unusual in a treatment for infantile paralysis which results in either death or "extensive residual paralysis" in more than one case out of five. Furthermore, Dr. Pohl states that 12 of the above patients require crutches, 8 require braces, and 10 need a cane.

As regards the degree of residual paralysis these figures are not superior to the results obtained by others. For example, Lenhard¹ reports that of 130 cases in Bal-

timore in 1941, all of whom were treated by conventional procedures, twenty patients, or 16 per cent, have moderate to severe residual paralysis. An additional number had slight paralysis, as was also the case in the Kenny series. Only two patients died in the Baltimore series.

In view of these figures it is quite surprising that Dr. Pohl indicates in another part of his paper that since the advent of Sister Kenny, the number of children in Minneapolis so crippled by poliomyelitis as to have to attend the public school for crippled children has been reduced to zero. Since by his own assertion sixteen per cent of cases are extensively paralyzed, many to the extent of requiring braces and crutches and some "with practically complete abdominal and spinal paralysis as well as complete paralysis of both legs," is it possible that a psychological factor has a bearing here? Anyone who has seen Miss Kenny work will testify that her psychological influence over her patients is great enough to determine their behavior against great odds.

In fairness, it should be said that although Dr. Pohl presents no objective data on the point, a number of competent observers are agreed that Sister Kenny's physical therapy techniques result in a satisfactorily low incidence of deformity. If Miss Kenny were satisfied with credit for having developed and used a method of physical therapy which although not unique is highly successful in this regard there would be no controversy.

However, Dr. Pohl places the greatest stress upon the validity of Miss Kenny's new "concept" of the disease. According to him, "the most significant point in Miss Kenny's work is that of a new concept of the neuromuscular symptomatology of the disease . . . (which) is primarily and most importantly an affection of the peripheral structures, principally the muscles and their fascial coverings but including the skin and subcutaneous tissues, and that disturbing functional changes in the central nervous system occur secondarily."

Thus Dr. Pohl subscribes to the Kenny notion that poliomyelitis is primarily a disease of skin, connective tissue, fat and muscle, and that the nerve degeneration results secondarily through "alienation" and "incoordination." He admits that this new "concept" of poliomyelitis "would seem to place an indigestible issue" before any scientific medical investigator, whom he characterizes as "orthodox."

The so-called "Kenny concept" of poliomyelitis is so untenable in view of the enormous mass of neuropathological and neurophysiological evidence which anyone who will take the trouble to read scientific medical literature or make a scientific study can verify, that it would not be worth refuting were it not for the international publicity which has been given to the view. There is actually no valid evidence in medical literature indicating that poliomyelitis "is principally peripheral in nature." Instead, the literature is full of convincing evidence to the contrary.

The "Kenny concept" has been built up to fictitious importance largely by salesmanship and wishful thinking. It is to be hoped that the public which has taken an interest in Miss Kenny's publicized career may finally realize that under her care during a five year period in

spite of her "concept" and treatment, about six and a half per cent of patients have died, and sixteen per cent have "extensive residual paralysis," varying in degree from virtually complete incapacity to states requiring braces, crutches or canes for locomotion.

Science is the search for truth. It is a misfortune when anything is permitted to confuse that search. It is doubly unfortunate in the field of medicine because so many unhappy victims of disease are led to search for the impossible because of such confusion. It is to be hoped that some day the public will be wise enough and sufficiently informed to refuse to be misled by unsound theories and "concept." In the meantime it is the duty of honest physicians to oppose and expose false prophets irrespective of their sincerity. Fidelity to sound science is not a glamorous pursuit, nor a financially lucrative one, but it does enhance one's self-respect, and in the long run brings the respect of the world. Notoriety based on false premises is fraudulent and short-lived. This is true even when the deception is in the first instance self-deception.

Maurice B. Visscher
Jay A. Myers

¹ Lenhard, Raymond E.: The results of poliomyelitis in Baltimore. *Journal of Bone and Joint Surgery* 25:132-141, 1943.

"When there has been clear failure to employ reliable methods and to justify conclusions and when in consequence error is slipping into the 'beautiful edifice of scientific truth,' a crusading spirit seems to me appropriate, expressed in acts to protect that edifice."—(From *The Way of an Investigator*, by Walter B. Cannon, M.D.)

CAPITAL PUNISHMENT FOR CAPITALS

A Gallup poll on the use of capitals would surely prove at least one point—that nearly everyone has a capitalizing rule of his own, a rule compounded of his egoistic drive, the importance he ascribes to the Word, his feeling for the aesthetic appearance of his page and his vague memories of what he was taught in grade school.

Such is the conclusion of your harassed editor after hours spent in searching for an ironclad rule wherewith to uphold the monthly slaughter of capitals that takes place in the JOURNAL-LANCET's editorial office. For capital usage, it seems, is a purely personal matter.

Turn to Webster's New International and you will find most of the school teachings of your youth confirmed. But newspapers, who stand no nonsense from their writers, pooh-pooh such old-fashioned notions and in their style-sheets issue directions widely differing from old Noah's. To the Gas-Fitters Union, for example, Webster gives the dignity of three capitals; one is all the newspapers grant; for newspapers, the words county, association, society, and the like, following the name, must be in lower case, while to Webster all these warrant caps. Disturbed, but still hopeful, we turn for light to Dr. Fishbein's admirable *Medical Writing*. Dr. Fishbein, we learn, goes along pretty well with the newspapers, but makes one vital exception. You have guessed it. The American Medical Association, its annual sessions, editor,

fellows, and indeed all that or who pertains to this august body *must* be capitalized. But for the rest of us it is the humble lower case. The Mayo Foundation too has a pamphlet for its writers and believe it or not, the Mayo Foundation, with no apology to Dr. Fishbein, holds that its Fellows are fully as worthy of caps as are those of the A.M.A.

A frantic search among various medical journals results only in a confusion that grows more and more confounded. Not only is there here no agreement on this vital issue, but often in the same magazine upper and lower case sport through the pages with regard apparently only to the whims of the authors. At this tense moment Robert S. Gill's fine little book, *The Author, Publisher, Printer Complex*, comes to the desk. We read and breathe a sigh of relief. With Mr. Gill we are wholeheartedly agreed. Says he, with a hint that he, too, has shared our desperation, "As to the capital, if there is any doubt, put it 'down'." Like the kitten pursuing its tail, like the Red Queen running on one square, we have arrived just where we started.

We confess that ours is largely an aesthetic prejudice. Too liberal a sprinkling of capitals on a page produces not only a messy but a distracting effect, too like the letters we have all received in which every other word is underlined, each sentence driven home with an exclamation point. So, until the grammarians offer us a precise rule we shall blithely follow our chosen course, borrowing at will from the best of Fishbein, the Mayo Foundation and newspaper usage and slaughtering at least 50 per cent of the capitals that come our way. Some day we will formulate our own rule and publish it on this page. In the meanwhile, contributors, remember, "if there is any doubt, put it 'down'."

M. U.

MEET OUR CONTRIBUTORS . . .

Dr. John Florian Pohl, Minneapolis, after graduating in medicine from the University of Minnesota, prepared for his specialty, orthopedic surgery, by graduate work at Harvard university and the University of Manchester, England. He is clinical assistant professor of orthopedic surgery at Minnesota's medical school, and attending orthopedic surgeon at the Minneapolis General hospital, Glen Lake sanatorium, Michael Dowling school for crippled children and the Elizabeth Kenny institute. He is a member of local and state medical societies, American academy of orthopedic surgeons, and diplomate, American board of orthopedic surgery.

Dr. F. L. Wicks, Valley City, North Dakota, graduated from the Keokuk medical college, C.P.&S., and has a degree in both pharmacy and medicine. He has taken many courses in ophthalmology and otolaryngology. He has served as president and secretary of the North Dakota academy of ophthalmology and otolaryngology, is a fellow of the American Medical Association, and a member of the Cheyenne medical society. He is the author of "Twenty-five Years of Ophthalmology in North Dakota" and of "Your Eye—! Light on Sight."

Dr. Joseph Alexander Holmes, practicing surgery in Boston and residing in Cambridge, Massachusetts, is a 1935 graduate of Harvard Medical school and a fellow of the American College of Surgeons. It is believed that he is still in the South Pacific theater.

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7. Social insurance contributions: 4 per cent each from employers and employees. A government contribution, when necessary, is authorized.
8. General provisions: Judicial review and a national advisory council. The bill also provides funds for medical and vocational rehabilitation of disabled persons entitled to disability benefits, to be handled by social security board, surgeon general and office of vocational rehabilitation.

Physicians should obtain copies of this proposed act and study carefully all of its provisions. Senator Wagner consulted with the American Federation of Labor, the Congress of Industrial Organizations, the Physicians Forum, the Committee of Physicians for the Improvement of Medical Care and the National Lawyers Guild, in obtaining suggestions for modification of his previous version. He did not consult with the American Medical Association.

Examinations in Pediatrics

The American Board of Pediatrics announces that its fall written examination will be held locally under a monitor, October 19. The oral examination will be held in New York, December 7 or 8. Dr. C. Anderson Aldrich, 115½ First Avenue S.W., Rochester, Minn., is secretary of the board.

News Items

Seventeen young people from five counties in South Dakota were examined in the biennial free clinic for crippled children held in Yankton on June 6. Dr. G. E. VanDemark of Sioux Falls, orthopedist, and Dr. Goldie Zimmerman, Sioux Falls pediatrician, made the examinations. Dr. A. Triolo of Pierre attended as director of the crippled children's division of the state board of health. These clinics are sponsored by the South Dakota Benevolent Protective Order of Elks and the state board of health, are entirely free and are held for crippled children to the age of 20. Last year fifteen such clinics were held in the state and several hundred children are now receiving treatment as a result.

The organization of the Black Hills Camp and Hospital Council of the American Red Cross was completed June 12 at the Rapid City, South Dakota, army air base. The purpose of the council is to coordinate with Red Cross field directors in providing personnel, equipment and recreation for the camps and hospitals needing such.

Dr. William Calvert Chaney of the Tennessee medical association and Dr. William P. Herbst, Jr., of the medical society of the District of Columbia, two former fellows in the Mayo Foundation during the years 1919-1924, have recently been elected presidents of their respective medical societies.

Dr. F. L. Wicks, president of the North Dakota medical association, and Dr. G. F. Campana of the North Dakota department of health are serving as members of the North Dakota planning committee which, coordinated with the National Commission on Hospital Care, is now taking the first inventory ever made of the state's hospitals. (See July editorial). Representing the university is Dr. H. E. French, dean of the school of medicine.

Drs. Edythe Hershey and B. K. Kilbourne, Helena, have been appointed by the governor members of the new hospital survey commission. Montana legislators have passed a bill providing for a hospital inventory in that state.

The two Albert and Mary Lasker Foundation awards have recently been announced for the second successive year. The awards of \$500 each are for significant contributions to the improvement of maternal health care and for research in human fertility. Further information may be had by writing to the Medical Committee, Planned Parenthood Federation of America, 501 Madison Ave., New York 22, N. Y.

The Massachusetts Medico-Legal society will hold its fourth annual seminar between October 1 and 6. It will include a six-day program of lectures and demonstrations having to do with death-investigation in the interests of public safety. For further information write to the society, 25 Shattuck St., Boston, Mass.

Dr. William Duncan of Webster, South Dakota, was installed president of the South Dakota state medical association at the annual convention. Dr. F. S. Howe of Deadwood is president-elect.

Dr. William Henry Phillips was honored officially in Jordan, Minnesota, by a "Phillips day" sponsored by the Jordan Commercial club and the Business and Professional Men's club to commemorate the 50th year of the doctor's service to that city. Former patients from all over the state attended the festivities that included a dinner, a meeting in the high school attended by more than five hundred persons, a band concert and the presentation of a generous sum of money. Dr. Phillips was graduated from the University of Minnesota medical school in 1894. He has served as mayor of Jordan and is a prize-winning grower of flowers in addition to being one of the busiest and best beloved doctors of the state.

Dr. T. Jones after more than a year's illness has recovered and returned to practice in Chamberlain, South Dakota.

Dr. F. E. Boyd after an absence of three years during which he served on the medical staff of the army air force, has returned to Flandreau, South Dakota, and resumed practice here.

Dr. William T. Ferris, Chamberlain, South Dakota, has returned to his home town to resume practice there again. He was obliged to leave the city because of illness.

Dr. Jack Hays, formerly practicing in Mammoth, Montana, has returned to Livingston, Montana, and is now associated with Dr. P. L. Greene. Dr. Hays has served in the army medical corps since 1938 and saw service in both Africa and Italy as a captain.

Dr. J. A. Mueller has opened an office in Lewistown, Montana. Dr. Mueller comes from Fenton, Iowa.

Major David W. Hilger, MC, of Rochester, Minnesota, formerly neuropsychiatry consultants division, has been assigned to Fitzsimmons General hospital, Denver, Colorado.

Lt. (j.g.) Austin M. McCarthy, former resident surgeon at Minneapolis General hospital and now a member of the medical staff of the Relief, a hospital ship, has been commended by his commanding officer for work in helping evacuate more than 3,000 wounded Americans from Okinawa.

Dr. T. Q. Benson, city health officer of Grand Forks, North Dakota, has been conducting health examinations for pre-school children. This plan was adopted in 1944 and many defects were brought to light during the first examination last year. The idea is to have as many children as possible examined so that they may have the physical defects corrected insofar as possible before attending school.

Dr. J. A. Muggly of Madison, South Dakota, was named chairman of the state Foundation for Infantile Paralysis at its annual meeting held in Madison June 20. He succeeds Dr. D. S. Baughman.

Dr. D. S. Baughman and Miss Nancy Baughman of Madison, South Dakota, have been in the east since June 15th, visiting a son Richard (intern) and daughter Mary Lou (cadet), both in Philadelphia General hospital. Richard went into the army July 4. They visited also another daughter, Shirley. Dan Baughman, a son, is missing in submarine service, but there is hope that he may be safe.

Eighty-one children were examined in Grand Forks county, North Dakota, at the end of the child health conferences in that county. Dr. Robert St. Clair conducted the Northwood clinic, Dr. C. O. Haugen the Larimore clinic, Dr. F. O. Robertson that for Gilby, Dr. W. C. Dailey for Inkster, and for Niagara. Clinics were sponsored by the state department of health, county health department and local civic organizations.

Dr. N. A. Kaa of Corvallis, Montana, has been appointed county health officer. Dr. R. E. Brogan, former Deer Lodge physician, has moved to Billings. He will continue to handle the contract work for the mines at Roundup.

Dr. J. Nelson Ewbank has resigned his position as acting superintendent of Sand Beach sanatorium at Lake Park, Minnesota, to take up a similar position in his home community of Urbana, Illinois.

Dr. Arthur H. Wells, head of the pathology department at St. Luke's hospital, Duluth, was elected first vice president of the Minnesota cancer society to fill the vacancy caused by the death of Dr. Max Alberts.

Dr. Neil M. Leitch, formerly of Warroad, Minnesota, has established offices in the Buffalo Block, Kalispell, Montana.

Dr. L. H. Winer, specialist in skin diseases, 505 Medical Arts building, Minneapolis, and associate professor in the department of dermatology of the University of Minnesota Medical school, is removing to Beverly Hills, California, where his address will be 415 North Camden Drive.

Surveys to determine the shortage of doctors and medical facilities in South Dakota have been undertaken by the South Dakota Health Planning committee. The actual work will be done by the extension service, farm security administration, and the South Dakota Nurses association.

Dr. Claude C. Kennedy, Minneapolis, state chairman of the Medical and Surgical Relief committee of Minnesota, has received word of the safe arrival in Ambohitra, Madagascar, of a large shipment of sulfa and arsenic drugs sent in answer to a plea from the mother superior there. To date the national committee has forwarded \$729,455 worth of medical and surgical supplies to various parts of the world.

Dr. Sidney A. Cooney of Helena took over the presidency of the Montana State Medical association at the close of its annual meeting on July 15. Dr. Maurice A. Shillington of Glendive was named president-elect; Dr. Walter H. Stephan of Dillon, vice president; Dr. Ray F. Peterson of Butte was re-elected secretary-treasurer. Mrs. Irving J. Bridenstine of Terry was chosen president of the women's auxiliary.

Necrology

Dr. Horace Newhart, 72, Minneapolis, Minnesota, died July 9 at the Northwestern hospital of cancer. Dr. Newhart's contributions to otology won for him an extensive reputation throughout the country. A professor of otolaryngology at the University of Minnesota, he had been president of national and local otological societies, a fellow of the American College of Surgeons, and a member of many national medical and honorary societies. He was largely responsible for establishing periodic hearing tests in the Minneapolis schools and in those of other cities.

Dr. H. H. Aldrich, 64, DeSmet, South Dakota, died June 16 of a heart attack as he was walking home from his office. He was born in Remington, Indiana, and graduated from St. Peters hospital, St. Peter, Minnesota, in 1902 and also from the Sioux City Medical school, Sioux City, Iowa, in 1908. He practiced at Roscoe and in various other parts of the state of South Dakota. Dr. Aldrich had come to DeSmet but a few months ago from Wessington. His death leaves but two doctors in the county, none at all in its western half.

Dr. R. V. Overton, Winner, South Dakota, 65, died June 20, at St. Joseph's hospital, Sioux City, Iowa, from coronary thrombosis. A graduate of the University of Nebraska, he practiced in Gregory and Tripp counties from 1905. He was a counselor of the Rosebud district medical association and secretary of the Rosebud association at the time of his death and for a number of years preceding.

Dr. H. H. Brenner, 35, Minneapolis, was drowned in Detroit lake, July 5. Dr. Brenner was a graduate of the University of Wisconsin medical school and was on the staff of the General hospital.

Dr. D. F. Doyle, 75, Minneapolis, died of a heart attack July 5, as he was backing his car out of his garage.

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MAY 19, 1945

APRIL EXAMINATION

Name	School	Address
Anderson, James Robert	Northwestern, M.B. 1943, M.D. 1944	Mayo Clinic, Rochester, Minn.
Ashley, William Francis	U. of Illinois, M.D. 1943	Mayo Clinic, Rochester, Minn.
Ashman, Hubert Chidester	La. State U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Bearzy, Herman J.	U. of Pittsburgh, M.D. 1943	Mayo Clinic, Rochester, Minn.
Bradley, William Francis	Ohio State U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Clark, Frank Harrison	U. of Ore., M.D. 1943	Mayo Clinic, Rochester, Minn.
Crowley, James Harvey	U. of Minn., M.B. 1944	Mayo Clinic, Rochester, Minn.
Davis, Richard Merrill	Indiana U., M.D. 1944	Mayo Clinic, Rochester, Minn.
DeVoe, Robert Wesley	Creighton U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Distler, Edward Karl	Col. of Med. Evang., M.D. 1944	Mayo Clinic, Rochester, Minn.
Doherty, Elmer Michael	Marquette U., M.D. 1944	648 Hollywood Ave. W., Detroit, Mich.
Eckstein, Arthur William	Northwestern U., M.D. 1912	Elko, Minn.
Ferayorni, Richard Rudolph	Long Island School of Med., M.D. 1943	814 Nicollet Ave., Mankato, Minn.
Ferris, Harold Aaron, Jr.	Tulane U., M.D. 1944	Mayo Clinic, Rochester, Minn.
Goltz, Robert William	U. of Minn., M.B. 1944	2259 Summit Ave., St. Paul 5, Minn.
Hansbro, Gerald L.	Northwestern U., M.B. 1943, M.D. 1944	Mayo Clinic, Rochester, Minn.
Higgins, Robert Sours	St. Louis U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Jennings, David Thorington	U. of Pa., M.D. 1943	Mayo Clinic, Rochester, Minn.
Johann, Orlando Peter	Marquette U., M.D. 1944	544 S. 7th Ave., West Bend, Wis.
Karstens, Andres	U. of Oregon, M.D. 1943	Ancker Hospital, St. Paul, Minn.
Karstens, Hans Carsten	U. of Oregon, M.D. 1943	Mayo Clinic, Rochester, Minn.
Kirby, Joseph Lonnie, Jr.	Emory U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Kozarek, Clarence Edward	U. of Minn., M.B. 1944	25 E. Fifth St., Duluth, Minn.
Ludden, Theodore Edward	U. of Oregon, M.D. 1943	Mayo Clinic, Rochester, Minn.
Mayfield, Leroy Henning	U. of Tennessee, M.D. 1939	Mayo Clinic, Rochester, Minn.
Mezen, James F.	U. of Buffalo, M.D. 1944	Ancker Hospital, St. Paul, Minn.
Palmer, James Keith	Med. Col. of S. Car., M.D. 1943	Mayo Clinic, Rochester, Minn.
Rovelstad, Randolph Andrew	Northwestern U., M.B. 1944, M.D. 1944	Mayo Clinic, Rochester, Minn.
Sheldon, Keith Walker	U. of Nebraska, M.D. 1943	Mayo Clinic, Rochester, Minn.
Sheridan, Viola Ellen	Creighton U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Skillern, Penn-Gaskell	U. of Indiana, M.D. 1944	Mayo Clinic, Rochester, Minn.
Smith, Donald Eugene	Washington U., Mo., M.D. 1943	Mayo Clinic, Rochester, Minn.
Spear, Richard Conrad	Ohio State U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Spurbeck, George Headley	Marquette U., M.D. 1944	Proulx Bldg., Cloquet, Minn.
Starks, William Oscar	Indiana U., M.D. 1944	Mayo Clinic, Rochester, Minn.
Tomlin, Hugh Malcolm	Louisiana U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Troxell, Millard Andrew	University of Iowa, M.D. 1944	Hawarden, Iowa.
Wallace, Robert Bruce, Jr.	Tulane U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Wells, John Joseph	Creighton U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Wieczorowski, Elsie Irene	Northwestern U., M.B. 1944, M.D. 1945	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Bane, Helen Whittemore	U. of Minn., M.D., 1937	303 N. 5th St., Brainerd, Minn.
Broders, Albert Compton, Jr.	Med. Coll. of Va., M.D. 1943	Mayo Clinic, Rochester, Minn.
Chapman, Jesse Pugh, Jr.	U. of Pa., M.D. 1943	Mayo Clinic, Rochester, Minn.
Conroy, Martin Patrick	U. of Ark., M.D. 1943	Foley, Minn.
Coughlin, William Joseph	U. of Toronto, M.D., 1934	Mayo Clinic, Rochester, Minn.
DeForest, Ralph Edwin	Wayne U., M.D. 1943	Mayo Clinic, Rochester, Minn.
Elliott, Robert Burl	U. of Iowa, M.D. 1943	University Hospital, Minneapolis 14, Minn.
Forsyth, H. Francis	U. of Mich., M.D. 1940	401 Med. Arts Bldg., Minneapolis 2, Minn.
Gogela, Louis James	U. of Neb., M.D. 1943	Mayo Clinic, Rochester, Minn.
Jensen, Garver Llewellyn	Stanford U., M.D. 1944	Mayo Clinic, Rochester, Minn.
Latterell, Kenneth Edward	Wayne U., M.B. 1941, M.D. 1943	Mayo Clinic, Rochester, Minn.
Loose, William David	U. of Pa., M.D. 1942	Mayo Clinic, Rochester, Minn.
Otten, Alex John	Northwestern U., M.B. 1936, M.D. 1937	404-5 First Nat. Bk., Grand Forks, N. D.
Sicher, William David	Rush Med. Col., M.D. 1940	Mayo Clinic, Rochester, Minn.
Simmons, Donald Ray	Wayne U., M.D. 1943	2024 Commonwealth Ave., St. Paul, Minn.
Strong, Munro Lawrence	Creighton U., M.D. 1935	Mayo Clinic, Rochester, Minn.

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Blank, Samuel	Med. Col. of Va., M.D. 1941	University Hospital, Minneapolis 14, Minn.
Knoll, William Valentine	Col. of Med. Evang., M.D. 1935	St. Mary's Hospital, Duluth, Minn.
Lombardi, Alfonso, A.	U. of Buffalo, M.D. 1943	Mayo Clinic, Rochester, Minn.
Macy, Jr., Dorothy	Woman's Med. Col. of Pa., M.D. 1944	Mayo Clinic, Rochester, Minn.
Morris, Benjamin Henry	Cornell U., M.D. 1943	1009 Nicollet Ave., Minneapolis 2, Minn.
Olsen, Gertrude Emily	Col. of Med. Evang., M.D. 1937	Georgetown, Minn.
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For the first time someone has compiled a list of medical and surgical terms in the shape of a vest-pocket word book for medical students, nurses, technicians and other affiliates of the medical sciences so that all such may acquire a medical vocabulary quickly and easily. It is the work of C. J. Birtcher, president of Birtcher Corporation, 5087 Huntington Drive, Los Angeles 32, California, and will be sent free of charge in quantities to medical schools, hospitals with courses in nurses training, medical technicians schools, and surgical supply dealers as well as to physicians and surgeons and medical writers.

Beginning with a list of terms for the parts of the body the book concerns itself with the Greek and Latin words from which most of the descriptive terms of medicine have been derived and the prefixes and suffixes that combine with them as modifiers. There follow examples in word building, exercises in word analysis and a word list that appears comprehensive. The author estimates that an alert mind will have mastered enough root words, prefixes and suffixes in a half hour to have given himself a working knowledge of medical and surgical terminology. The booklet is copyrighted and represents a useful contribution to all workers in the field.

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Body Minerals*

W. G. Richards, M.D.

Grand Forks, North Dakota

MUCH ado is made of diet both for the sick and the well, and elaborate lists are handed to patients for each and every disease, but, as a matter of fact, our actual knowledge about food, its ideal composition, its assimilation, and its utilisation, is small. The title which Dr. Cathcart chose for his Oliver-Sharpey lectures for 1940 on nutritional problems, *The Mystery of Alimentation*, was accordingly a most apt one, and in this he truly says: "What a mystery alimentation is. Here daily before our eyes, by processes unseen and virtually unknown, a real transubstantiation takes place. The dead inert matters which comprise the food-stuffs are converted into living flesh."¹

We have come some little distance though from the time when proteins, carbohydrates, and fats were the only things considered in dietary planning. We have learnt something about the vitamines. We have also learnt a little,—a very little,—about the minerals, the inorganic vitamines, as they have been called. This paper is an attempt at a sketchy summary of their rôle, sketchy necessarily because each one would itself need an entire paper even to fringe the subject. There are advantages, however, in a sort of air-plane view of the territory, for we can thereby see the individual minerals in some sort of relationship with one another, and are better able afterwards to consider each one separately and in more detail.

Sodium has long been recognised as a necessary mineral, and as sodium chloride has been added to the diet of men and beasts from time immemorial. It plays an important part in the maintenance of the acid-base equi-

librium, and, as the base of the interstitial fluids, is concerned with the exchange of water between these and the cells. Root² says that "the sodium ion is of such specific importance that the state of shock may be regarded as due to tissue damage resulting from sodium deficiency." Its vital importance is also shown in Addison's disease, where, due to the lack of a hormone from the suprarenal cortex, it is excreted by the kidneys in such amounts that there is a deficiency of it in the body. There is an intimate relationship between certain minerals and endocrine glands. We shall see it again in connection with iodine and the thyroid, and calcium and phosphorus and the parathyroids. It is quite possible that further knowledge will show it to exist between other glands and minerals. The effects of sodium deficiency are again shown where there is an excessive loss through the skin in perspiration, as in those working in high temperatures.

Closely related to sodium is potassium. It is the intra-cellular base, sodium's opposite number. By the osmotic pressure exerted by these two minerals through the cell membranes the exchange of water and solutes is effected between the cells and the intercellular spaces; there is very little interchange of the two minerals themselves. There is an optimum ratio between these two, and, as most of our foods contain more potassium than sodium, to preserve the balance we have learned to add sodium in the form of salt. Our taste, as it often does, has directed us correctly. If the kidneys are normal an excess of potassium will be promptly excreted, for the renal threshold for potassium is comparatively low, but if not normal an excess may cause serious symptoms.

As potassium is mostly found in the cells, disturbances of its metabolism would be expected to manifest them-

*Read at meeting of Billings Clinical Association March 16, 1945.

selves principally in the great cell masses, as the muscles. An excess has been shown to produce paralysis of the skeletal muscles and cardiac arrest, preceded by auricular or ventricular fibrillation and intraventricular block.³ Queerly enough, however, a low blood potassium exists during the attacks of paralysis in periodic family paralysis, which is abolished by the administration of potassium.⁴ Pudenz et al.⁵ consider, however, that in this disease the chemical defect responsible for the paralysis lies in the central nervous system and not in the muscles. The earliest effect of an excess of potassium on the heart is shown by an increase in height of the T wave of the electrocardiogram, while in family paralysis this wave is lowered. Nervous tissues are also affected, paresthesias of the hands and feet being an early symptom.⁶ Kendall⁷ considers that potassium is intimately connected with carbohydrate metabolism, and that the effect of insulin upon it may be as important as its effect upon blood sugar. More knowledge is needed about potassium, but sufficient has been learned to indicate its importance, and to suggest caution in its therapeutic administration, especially in the presence of kidney disease.

Ordinarily both potassium and sodium are obtained in sufficient amounts with an ordinary mixed diet, supplemented as it usually is by common salt. The amount of sodium in the body of a 70 kilo adult is about 63 grams, of potassium 150; most of the sodium is contained in the interstitial fluids and supporting structures, and the potassium mostly in the cell masses. The amount of sodium in the blood serum is 330 mgs. per 100 cc. (143 Meq/1) of potassium 20 mgs. (5 Meq/1). In the blood cells sodium is 23 mgs. (10 Meq.) and potassium 420 mgs. (105 Meq.)

Chlorine, being usually united with sodium as sodium chloride, is so closely related with it metabolically that it is difficult to separate their specific effects. It is concerned with the maintenance of the acid-base equilibrium of the blood, representing an acid factor, and also with the osmotic pressure of the interstitial and intracellular fluids. It forms the hydrochloric acid of the gastric juice. There are about 85 grams of it in an average adult body, mostly in the extracellular fluids, and, therefore, in those tissues containing most water, as the skin, subcutaneous tissue, blood, and muscle. There is little of it in the cells themselves, except in the red blood cell, which is unique in having a high chlorine content. It is excreted principally by the kidneys and skin. Like sodium, the kidneys jealously guard it, for it is a high threshold body. In the blood serum it is about 365 mgs. per 100 cc. (103 mgs/1).⁸ As we get plenty of it in our food the providing of it ordinarily need cause us no concern.

Calcium and phosphorus are intimately related. The administration of calcium is an old practice. I remember as a boy one of my schoolmates telling us that his brother was taking lime water, and was getting bonier than ever. A tremendous amount of work has been done on calcium and phosphorus metabolism, and I must remind you again that this paper only attempts to hit the high spots.

Calcium makes up about 2 per cent of the body weight, mostly,—about 99 per cent,—in the bones and teeth.⁹ It forms the supporting structures in vertebrates,

its tendency to form insoluble salts making it admirably adapted for this purpose. This tendency, however, has its disadvantages, for it makes the absorption of ingested calcium from the gut difficult, and facilitates its precipitation along the path of its elimination, as in kidney stone. Indeed, McCance¹⁰ says that were the kidneys the only path for its elimination man would probably long ago have been exterminated through sheer inability to excrete his unwanted calcium. Mammals fortunately early learnt to get rid of most of it through the intestines, where its insolubility could not cause mechanical obstruction.

It is present in the blood to the amount of about 10 mg. per 100 cc. (5 meq/1), almost entirely in the serum, and is partitioned into three fractions, 4.5 mg. to the 100 cc. combined with the proteins, the so-called non-diffusible fraction,—it is doubtful whether this is physiologically active,—2 mg. ionised in simple physical solution, and 3.5 mg. unionised in organic compounds.^{11,12}

Besides supplying the supporting tissues, calcium helps to control the heart beat, the contractility of muscle, and the transference of impulses at the neuro-muscular junction and through the synapses. In general calcium ions lessen the irritability of the tissues containing them.¹³ It also plays a part in the coagulation of the blood. It is controlled by the parathyroid glands, through the parathyroid hormone, which seems to maintain the blood level by breaking down bone to release calcium, while vitamin D increases its absorption from the intestines. But the relationship between these two factors is rather uncertain, in that in many respects they seem supplemental. Incidentally dihydrotachysterol is a synthetic product, resembling parathyroid extract.

A deficiency of vitamin D causes rickets. A deficiency of parathyroid causes a low level of blood calcium, and, as a result, tetany, asthma, trophic disturbances of the nails and teeth, alopecia, cataracts, and mental symptoms as depression, delirium, and dementia. An excess, as in parathyroid tumors, produces decalcification of the bones, as in osteitis fibrosa cystica, and a flooding of the blood with calcium, resulting in metastatic deposits of calcium in the kidneys, blood vessels, and lungs.

The normal requirement of calcium for an adult is said to be about one gram per day, which we get mostly from green vegetables, nuts, eggs, milk and its products, as cheese and butter. Meat is a poor source. Shellfish is a good one. Where there is much chalk a considerable amount of calcium is obtained with the drinking water. However, all the calcium ingested is not absorbed from the intestines, for the alkalinity of the intestinal secretions tends to form insoluble calcium phosphate and carbonate, this occurring when the pH rises above seven.¹² Lactose in the diet aids absorption. An excess of inorganic phosphorus, magnesium, or potassium also hinders absorption. Foods containing oxalic acid, as spinach, strawberries, and rhubarb, prevent absorption because of the formation of insoluble calcium oxalate. McCance¹⁰ says: "There may be enough oxalic acid in a helping of rhubarb or strawberries to immobilise all the calcium eaten at that meal." He also points out that cereals and nuts are an uncertain source of available calcium, as

much of it exists within them as phytin, the calcium magnesium salt of inositol hexaphosphoric acid, and we have no enzyme capable of hydrolysing this. For this reason an excess of cereals promotes rickets. An excess of fat in the diet causes the formation of insoluble calcium soaps, which also occurs in such diseases as sprue.

Phosphorus (after calcium) is the next largest mineral constituent of the body—1.2 per cent phosphorus as against 2.2 calcium.⁹ It is normally present in the blood serum to the amount of 3 to 4 mg. per 100 cc., but this only represents the inorganic phosphorus, and the inorganic phosphorus of the body amounts to only one-twelfth of the total phosphorus. In the cells most of it exists in the form of organic radicles, as nucleoprotein of muscle, phosphoprotein of milk, phospholipines, as lecithin, in nervous tissues, liver, egg yolk and pancreas.¹² McCance¹⁴ calls it the most interesting inorganic constituent of the body. He says: "Even if we find out all about magnesium, iodine, etc., I think the record of phosphorus will be hard to beat. It is used in the proteins, it is used in the fatty membranes and in fat metabolism, in the nuclei, in the bones, in the regulation of the body's reaction, and as for its part in carbohydrate metabolism—whenever the body wants to do anything to a carbohydrate molecule, even absorb it from the gut, it seems to turn it into a phosphate ester with incredible speed, to do what it wants to the molecule, and then to de-esterify it again with equal ease. Nothing can live without phosphorus; most living organisms require large amounts." This ability to utilise phosphorus in these many ways seems to depend upon certain enzymes, the phosphatases, which are widely distributed in mammalian tissues. Phosphatase in the blood plasma is increased in certain diseases of bone, and in rickets this increase antedates roentgenographic changes and alterations in the blood serum phosphate.^{12,15} Vitamin C is a powerful activator of serum phosphatase, the activity of which is markedly decreased in scurvy.¹⁶ It has also been suggested that vitamin D may exert its action by the conversion of organic to inorganic phosphorus in bone.¹⁶ In rickets and osteomalacia there is an impairment of phosphorus and calcium metabolism, remedied by vitamin D. There is also a phosphorus deficiency disease of cattle, which has been investigated principally in South Africa and Minnesota. It causes retardation of growth and abnormal skeleton development, the animal becoming stiff and lame with pain on movements, and the bones fragile and liable to fracture. It occurs where the soil, and consequently the grass, are deficient in phosphorus.¹⁷ It is interesting that these animals seem instinctively to recognise their needs, for they develop a craving for bones, eating carcasses, and even killing and eating young lambs. We might remember this when we interfere with people's natural selection of foods.

We get most of our phosphorus from meat,—which, by the bye, is low in calcium,—milk, egg yolk, cereals, nuts, beans, fish. Generally an ordinary mixed diet will provide sufficient phosphorus. In connection with fish an old tradition considered fish a desirable food for brain-workers, for there is a large amount of phosphorus in the brain. The connection was summarized by the Ger-

mans in the aphorism "Ohne Phosphor keine Gedanke." The connection undoubtedly lies in the relation between phosphorus and carbohydrate metabolism, for the brain depends almost entirely for its nutrition upon carbohydrates, a fact which has been impressed upon us by the profound mental effects of excessive doses of insulin and the consequent hypoglycemia.

Magnesium is closely related to calcium and phosphorus in the body. It exists in all the tissues and fluids, the largest amounts being in the bones and muscles. In the bones it amounts to one-eighth the amount of calcium. In the muscles, however, it is in greater amount than calcium, about twice as much, but for what specific purpose we do not know. In the blood serum it amounts to 1 to 3 mg. per 100 cc. Our knowledge concerning its role in nutrition in the human is very limited, but cattle, where magnesium is deficient in the soil, and consequently in the grass, suffer from "grass tetany," finally going into convulsions and coma.¹⁸ In experimental rats a deficiency of magnesium in the diet was associated with vasodilatation, hyperemia of the cutaneous vascular system, increased irritability, cardiac arrhythmia, and spasms, while there was an increase in the amount of calcium in the heart, kidneys, and muscles. In calves there was extensive deposition of calcium in the heart, blood vessels, and soft tissues.¹⁹ Hirschfelder²⁰ says that while ingestion of magnesium, as with the administration of epsom salts, generally causes no harm, the excess being rapidly eliminated by the kidneys, but when these are damaged, as in nephritis, serum magnesium will rise and coma and death result. He says that many cases diagnosed as uremic coma are really magnesium coma, and cautions against the giving of magnesium sulphate in kidney cases. He also says that animals with slightly raised plasma magnesium were more sensitive to morphine, and attributes Osler's caution about giving morphine to old people and nephritis to the fact that he used magnesium sulphate liberally and had noticed this effect. He describes cases of muscular twitchings and convulsions due to magnesium deficiency and relieved by the sulphate. Pines²¹ recommends magnesium sulphate intravenously in spastic conditions of blood vessels. But this seems contrary to the observation previously referred to that deficiency of magnesium results in vasodilatation.

Sulphur, being an integral part of the protein molecule, is, of course, an indispensable mineral element, but otherwise its rôle is not very definite. There is no clear-cut syndrome due to its deficiency as there is for sodium and potassium or calcium and phosphorus.

Sulphur occurs in the body to the extent of 1.96 grams per kilo., mostly in the muscles, skin, hair, and bones. Red hair contains more sulphur than other colors, possibly accounting for the fiery disposition of red-headed people. It enters into combinations with carbohydrates as in mucoidin, glutathionic acid, and chondroitin, and with lipids in the brain and nervous tissue. In the proteins it occurs in the amino acids cysteine, cystine, methionine, and ergothioneine, methionine being an "essential" aminoacid. It enters into the composition of the bile salts. It occurs in insulin, in heparin.²² It is mostly eliminated by the kidneys, and since it is a very low threshold body

little is reabsorbed by the tubules from the glomerular filtrate. Where the kidneys are damaged there is a retention of sulphur in the blood, caused mostly by an impairment of glomerular filtration, though in the toxemias of pregnancy this retention is also due to tubular reabsorption. According to Goudsmid and Keith²³ there is a marked sulphur retention in hypertensive cardiovascular disease. These authors say that its level in the blood is a more delicate indication of impairment of kidney function than that of urea. Normally its blood level is about 5 mg. per 100 cc. In cystinuria the metabolism of cystine, a sulphur containing aminoacid, is impaired and it is excreted by the kidneys with the formation of multiple cystine calculi. With it occur hysterical symptoms and arthritis.²⁴

The provision of sulphur in the dietary need cause us no concern, for we get plenty in the ordinary proteins we eat. Indeed, the fact that it is a low renal threshold body would seem to indicate that the body is anxious to get rid of it, and therefore makes little provision for its resorption by the kidney tubules. However, its potency for good and evil has long been known, for it is an old remedy. The sulphur and molasses of not so many years ago will occur to you, and now we have revived it in the sulphanilamides. These show, too, the harm it may do by the neutrophilic granulopenia induced by them, and more recently by thiourea in the treatment of hyperthyroidism.²⁵ As an external remedy it still makes up a large part of the armamentarium of the dermatologist, and natural sulphur springs will probably always be popular, for the smell suggests therapeutic efficacy.

Recently I was told by a coal dealer that he sells a considerable quantity of fine coal to the breeders of pigs. The pigs, he told me, eat it with avidity, to the great improvement of their nutrition. He thinks it is the sulphur in it which is the nutritional factor, for other coals which contain little sulphur are refused by the pigs.

Since its connection with diseases of the thyroid gland has been recognised probably no mineral has received more attention than iodine. However, as in so many other matters, the ancient Greeks anticipated us, for, according to Dr. Bing,²⁶ they used burnt sponges, which contain iodine, for the treatment of goiter. It is decidedly an essential mineral. Upon its ingestion in sufficient quantities depends the efficient function of this gland, which controls the rate of energy production or metabolism. It is another instance of the direct connection between a mineral and an endocrine gland. The iodine in the thyroid is united to a protein molecule, thyroglobulin, of which thyroxin seems to be the most active part. There is another fraction, diiodotyrosine, which seems to be an intermediate product. Deficiency of iodine results in simple goiter, which is a compensatory hypertrophy of the gland, as if it acted like an ore processing plant which had to handle a poor grade ore, requiring a larger plant to handle it. When the iodine supply is so small that not enough can be obtained for the body requirement then we have hypothyroidism or myxedema. If for any reason the thyroid mechanism is too active and too much thyroxin produced then we have some form of hyperthyroidism. This probably is an oversimplification,

for there is much we do not yet understand, as, for instance, why in hyperthyroidism an excess of inorganic iodine will produce a remission of symptoms. That the secretion is an imperfect one, which is corrected by the iodine excess, is one explanation, but this hardly seems to fit the undoubted fact that the improvement is only temporary.²⁷

The normal blood iodine is about 12 micrograms per 100 cc. A man of 70 kilograms is said to contain about 25 milligrams of iodine in his whole body, of which 15 mg. are in the thyroid gland. According to Marine, if the thyroid contains iodine above 0.1 per cent of its solid matter goiter does not develop.²⁸ There is no agreement as to the amount of iodine needed to be ingested per day to meet the body's requirements, but Shohl gives it as about 0.05 to 0.10 mg. per day.²⁹ It undoubtedly varies at different ages and under different conditions. Pregnant and lactating women require more, and the requirements are increased during fever and infections.

We obtain it from foods and drinking water, these obtaining it from the soil. Consequently there is a great variability in their iodine content, for some soils are deficient in iodine. Where this is the case we find endemic goiter, corrected, as has been brilliantly demonstrated in recent years, by the addition of inorganic iodine. Infected water and insanitary conditions seem to create an additional demand for iodine, the correction of which in some places has alone prevented goiters. Garden vegetables and legumes generally contain more iodine than cereals and fruits.³⁰ Sea foods are a good source, and the dwellers by the sea obtain an additional supply from the iodine precipitated by the evaporation of sea water vapor in the air.

Iron is another mineral the therapeutic use of which was known before its physiological function, for Sydenham in 1664 mentioned its use for restoring the pink color to the cheeks of pale individuals.³¹ It is principally concerned with the transportation of oxygen to the tissues, and is carried by the hemoglobin of the red blood cells, hemoglobin being a compound of a globin and hematin. Upon it also depends the oxidation of food materials within the cells, this being effected through the agency of an iron containing pigment, cytochrome, and also the so-called respiratory enzyme of Warburg, containing iron. Macallum says that the "most important of all elements in the life of every cell is an iron-holding compound."³² The method of its action is much disputed, so much so that Whipple³³ has said that a monument erected to commemorate developments in iron metabolism would be a Tower of Babel. According to Sachs³⁴ it exists in the body in four forms, 1) hemoglobin iron, 2) plasma iron,—which is the transport iron, though it is not known how it is exchanged with the cells,—3) easily split off iron,—so called because weak acids free it from its chemical combinations in erythrocytes and plasma, its function not definitely known, it constitutes about 10 per cent of the total blood iron, is an organic compound, and is ionized and dialyzable,³⁵—and 4) nuclear iron, which is found in all cells and is part of the respiratory enzyme mechanism. The amount in the blood is about 50 mg. to 100 cc. of whole blood in

the male and 45 in the female, of which the largest part is in the hemoglobin. About a third of the total iron in the body exists in the liver, spleen, bone marrow, and kidneys, where it is stored for use as wanted. There is a great economy in the use of iron, for as the red blood cells are broken down it is stored in these organs and again utilized. During the last months of intra-uterine life there is a storage of iron and also copper in the liver of the fetus, to insure an adequate supply during the months of nursing, since milk is deficient in these elements. After the age of forty it is said that deposits of free iron are common in the brain.³⁶ This may be the reason why people as they get older become rusty and their brains develop an aversion to new ideas, but this seems to happen to some at a very early age.

Copper is closely related to iron. As hemocyanin it takes the place of iron in arthropods and molluscs.⁹ Shohl³⁷ says that hemocyanin represents the bronze age of living matter and hemoglobin the iron age. It occurs in all the tissues, the largest amounts being found in the liver, spleen, and kidneys. The adult body is said to contain from 100 to 150 mgs.,³⁴ and the blood serum contains 1 to 2 mgs. per litre. There is more in the corpuscles. It is undoubtedly a necessary mineral. It seems to act as a catalyst in hemoglobin formation, and aids in the mobilisation of iron when needed. Its amount in the blood is inversely related to that of iron, being increased in the anemias.³⁴ In nephritis, however, copper fails to rise with the decrease in iron. There is a difference of opinion as to the amount of copper needed, 2 to 7 mgs. being given as the daily needs. It is present in varying quantity in all types of foods, particularly in liver, oysters, nuts, and legumes. It is contained in water, and milk, and all liquids. As to the need of adding it in the treatment of anemias, Sachs says that it is unnecessary in the iron deficiency anemias, for he had never found a copper deficiency in the analyses of the blood he had made. In any case, he says, all iron pharmaceutical products contain some copper. However, it is not at all certain that this is the final word on copper.

These minerals which exist in the body in small amounts but are yet nutritional necessities, are the so-called "trace" elements. Besides copper and iodine there is a number of others in even smaller amounts. They seem to be intimately related to vitamins and it is said that some of the symptoms of vitamin deficiency are really due to deficiencies of these trace minerals, and that consequently synthetic vitamins, lacking these, may fail to achieve the purpose of their administration, and need supplementing by them. Deficiencies of some of them, while known to cause sickness in animals, have not yet been shown to do the same for humans. The presumption is, however, that they do.

Fluorine is another of these trace elements. A good deal of interest has been excited in it on account of its connection with the enamel of teeth. It is very commonly distributed in soils, and consequently in most food-stuffs. It exists as calcium fluoride or duorspar and calcium fluo-phosphate or apatite, which reacts with sodium chloride to form sodium fluoride, a much more soluble form. It is found in certain clays used for the making

of china and in association with lead ores. It is found in the smoke from factories using super-phosphate, as glass works, brick works and aluminum factories, from which it is deposited on contiguous land. As would be expected, there is a large variation in the amount in drinking waters, the largest amounts being from wells.³⁰ It is present in all tissues, but mostly in the bones and teeth, especially in the teeth enamel. In the blood there is 0.5 mg. per 100 cc.³⁹

Shohl says that fluorine has never been demonstrated to be essential by biological experiments, but where it exists to an amount greater than 1 part per million in the drinking water it produces mottling of the enamel of the teeth from deposition of fluorin.

This occurs where drinking water is used containing over one part per million of fluorine before the calcification of the teeth is completed. The normal translucency of the enamel is lost and a chalklike mottling appears. Pits occur on the surface of the enamel and at times a depressed horizontal line. Attrition of the enamel surface is evidence of a severe degree of fluorosis and teeth so affected break readily. The mottled enamel may later become stained by the deposition of pigment, varying in color from yellow to a deep brown, most often seen on the labial aspects of the anterior maxillary teeth.⁴⁰

An excess of fluorine in cattle and in experimental animals causes overgrowth of the teeth, besides making them brittle. Boddie⁴¹ says it makes them soft and causes inflammation of the surrounding gums. It also affects the bones, causing an osteosclerosis, especially of the spine, with synchondrosis and ossification of the intervertebral discs and wedging of the vertebrae. Animals grazing in the vicinity of superphosphate factories show lameness, enlargement of the bones, and cachexia.⁴²

However, when present in the drinking water in an amount not to exceed one part per million it is said to prevent caries, and the cities of Newburgh and Kingston in New York state are undertaking the experiment of adding fluorine to the drinking water in that amount in the hope of lessening caries. All do not agree with this, one speaker at a meeting at the London School of Hygiene in 1942 going so far as to say that in his experience fluorosis was associated not with less dental caries but with more.⁴² But the speaker seems to me to have missed the point, for it is not fluorosis which is claimed to prevent caries, but such small amounts as would have delighted the heart of the homeopath. The fear has also been expressed that increase of fluorine would make bones more liable to fracture. Recent work by McClure⁴³ however, negatives this. The whole question can hardly be considered settled, and the New York experiment will be watched with interest, though the responsible authorities will have a very unhappy time if mottled teeth become the rule in their communities.

Wilson⁴⁴ has noticed a relationship between the existence of endemic goiter and excess of fluorine in the soil with fluorosis.

Cobalt is probably another essential mineral, though existing in the body only in traces. Not much seems to be known of it in relation to the human, but in recent years much study has been done upon it in reference to

other animals. As far back as 1807 sheep had been known to suffer from a disease characterised by anemia and emaciation, locally known as "pining." First noticed in southern Scotland, it was later shown to exist in Australia and New Zealand under the names of bush sickness or the wasting disease, where it had become such a serious menace to the livestock industry that investigations were undertaken by the government. It has also been investigated in Kenya, Africa, in Florida, in Michigan, and western Canada under various names. It was finally shown to be due to a lack of cobalt in the soil and could be cured by administration of this or by adding it to the soil. It illustrates well the importance of infinitesimal amounts, for an average sheep needs only 0.04 mg. per day, and they can get this amount from grass or fodder in which even spectrographic methods are unable to detect cobalt. It is also to be found in certain sea animals, though it has not been shown to be present in sea water.⁴⁵ Evidently the animal cell must be able to take extremely small amounts and concentrate them. I wonder, though, whether there is not another explanation. For hundreds of years alchemists spent their time trying to turn iron or other "baser" metals into gold, and though with the rise of modern chemistry, and the conception of fundamental unchangeable elements, this transmutation of metals became ridiculed, recent science has found it possible. I wonder whether the animal cell is not able to do this too. It can do extraordinary things, often seemingly with ease doing things which the laboratory can only do with very great difficulty, and it seems to me that it may possibly be able to transmute elements, for who can put a limit to the powers of the animal cell?

An excess of cobalt has been shown to cause polycthemia in rats.

Zinc exists in the body to the amount of about 3 mg. per 100 grams weight. In the blood there is 0.5 to 0.7 mg. per 100 cc., one-third in the plasma and two-thirds in the cells.⁴⁶ Its particular function is unknown, but it is said to take part in oxidative processes. There is little danger of not getting enough, as it occurs in most foods and waters in sufficient though varying quantities, and an excess of it seems to be harmless.

Manganese is considered an essential mineral, though its functions, too, are not clear. It seems to have some effects on growth and the sexual glands. Male rats on a diet deficient in it develop sterility and testicular degeneration, while female rats produce nonviable young. Chickens deprived of it develop osteodystrophies. It is intimately connected with the activity of certain enzymes. It has been used in the treatment of anemias, though its utility is doubtful. The liver contains the largest amount, —170 micrograms per 100 grams of fresh tissue, and the blood 2 micrograms to the 100 cc., though it is found in smaller amounts in all tissues. We get it from milk, the bran of cereals, nuts, animal products, fish, and plants. How much we need of it is not known, probably about 0.3 mg. per kilo of body weight per day,⁴⁷ but as there are about 42 parts per million in whole wheat flour against only 7 in white,⁴⁸ McCarrison⁴⁷ seems to fear that the milling of cereals may have reduced the amount ingested below that needed and considers that children

should receive whole wheat bread to secure that needed for growth and also for the needs of the thyroid gland.

As silicon makes up 25 per cent of the composition of the globe⁴⁹ it is not surprising that we ingest considerable, several hundred milligrams per day. It is present in the blood to the amount of 16 mgs. or more per 100 cc.⁵⁰ The elasticity of the skin is said to depend upon it, the amount here decreasing with age. Silicotic lungs may contain as much as 12 per cent of the dried material.

Baudisch⁵¹ says that the water of one of the springs at Saratoga has been esteemed for many years as an eyewash and skin beautifier, which he attributes to the monosilicic acid. He also says that the fact that the aqueous humor contains silicon is perhaps more than an interesting correlation.

Bromine occurs in all tissues, about 1 mg. per cent, in the blood serum, with 0.5 mg. in the blood cells.⁵¹ The interesting thing about bromine is that it occurs in comparatively large amounts in the pituitary gland, 15 to 30 mgs. per cent.⁵¹ What the significance is we do not know, but from the analogy of iodine in the thyroid it is probably considerable. No doubt it will receive more attention in the future than it has in the past.

Such is a brief summary of the rôle of minerals in metabolism. Of some of them we have considerable knowledge, but of others very little. We should, however, at least think of them in planning dietaries, for food is more than mere fuel. After all, when we deduct the two-thirds of us which is water we are little else than animated dirt, and probably need more than the peck of this in our diet that the old saw says we have to eat before we die. Regarding our preoccupation with the three conventional kinds of foods Sir F. G. Hopkins hit it off rather nicely when, in reference to the feeding of cattle, he said:⁵² "We thought we were feeding our animals on proteins, fats, and carbohydrates, but what we were really feeding them was carrots and hay." When we eat our bread and cheese and beer, or our meat and vegetables and pie, we actually get more than we bargain for, and sometimes what we don't get is even more important. For this reason it is an advantage to obtain our foodstuffs from a variety of places, because the soil of one may be deficient in certain minerals, and the consequent deficiencies in the foods from that source are likely to be corrected in foods from others. Confining ourselves to "home products" may sound very patriotic, but, like isolationism in general, is not only selfish but silly, for it may compel us to go without something vital for our best development. No matter how good we may think we are, traffic with the outsider can often improve us both mentally and physically.

In spite of all our affectation of knowledge on foods and nutrition, we are probably blindly looking upon and misdiagnosing cases of deficiency quite often, and because of this our ignorance of the mysteries of alimentation I would emphasise the need of caution in planning dietaries. We may do more harm than good, for there are so many gaps in our knowledge that we cannot afford to be dogmatic. A plentiful mixed dietary, with a healthy respect for individual tastes and idiosyncrasies, is as likely

to be right as an elaborate diet list, much though this may impress the patient and his relatives.

And, in conclusion, let me quote the very wise advice to the cook and the housekeeper by the Furnases:⁵³ "The best kitchens are those in which almost nothing is thrown away, for it is the juices, peelings, and leaves which contain the accessory factors necessary for human health. The fuller the garbage pail the poorer the health. Stinginess in the kitchen is one of the greatest virtues."

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MEET OUR CONTRIBUTORS . . .

Among the varied and human pleasures of medical publishing not the least is the one that concerns our contributors,—their educational backgrounds, their personalities as revealed by their writings. That our readers may share this pleasure with us is the reason for these brief notes.

Dr. W. H. G. Richards, a graduate of the university of Minnesota, has practiced in Billings, Montana, for thirty-two years and specializes in internal medicine. He is president of the Yellowstone Valley medical society, is a fellow of the American College of Physicians and a member of various other national and local societies.

Dr. A. B. Baker, Minneapolis, Minnesota, is a distinguished neurologist and the holder of five degrees, the medical degree having been granted in 1940 by the University of Minnesota, at which institution he is associate professor of neuropsychiatry. Dr. Baker is a member of four associations of neurologists, neuropsychiatrists and neuropathologists and a member of Alpha Omega Alpha and of Sigma Xi as well as a diplomate of the American Board of Psychiatry and Neurology. His research interest in encephalitis is well known and he made three recent and important contributions to this journal.

Services Need Physical Therapists

Major General Norman T. Kirk, Surgeon General of the Army, and Vice Admiral Ross T. McIntire, Surgeon General of the Navy, declared that the return of the wounded from many fronts is intensifying the shortage of physical therapists and urge young men and women throughout the nation to avail themselves of the scholarships offered by The National Foundation for Infantile Paralysis which has appropriated \$1,267,600 for a physical therapy program. Applications for scholarships are being accepted at the National Foundation's offices, 120 Broadway, New York 5, N. Y. Postwar physical therapy will not only help repair the human damage of the war but also help overcome the less dramatic but none-the-less serious casualties of everyday peace-time life. Students who accept the scholarships are not required to limit their work to infantile paralysis patients upon completion of the nine and twelve months courses.

Tuberculosis Among College Students*

Fourteenth Annual Report of the Tuberculosis Committee, American Student Health Association, for the Academic Year 1943-1944

DURING the past three years there have been many factors which have interfered with the normal functioning of college health services. Yet the number of institutions having to discontinue their tuberculosis programs has been less than was actually anticipated. The committee is confident that as our college enrollments return to normal and adequate medical personnel becomes available, we shall witness substantial progress in college health activities. Many institutions expect a repetition of the experience immediately following the last war, when enrollments increased very markedly. Some of our state colleges and universities anticipate a 20 to 40 per cent increase in students over their pre-war levels. It is estimated that more than one-half million returning service men and women may take advantage of the opportunity for college training. Numerous communications have reached the committee during the past year indicating that many colleges are now planning various types of expansion which will provide more adequate and more constructive health programs. Increased health fees or appropriations are apparently in prospect at a considerable number of colleges. There is every reason to believe that tuberculosis programs will be instituted for the first time at many institutions just as soon as conditions permit. Undoubtedly many of us will be able to extend and improve our case-finding procedures so as to provide more adequate protection against tuberculosis for all of our students.

For the academic year 1943-44, the committee received 400 replies to the annual letter and questionnaire which was sent to 886 institutions. Table 2 shows the number of accredited colleges, by states, which were contacted by the committee, as well as the number of replies received and the number of colleges reporting programs. It will be noted that only 45 per cent of colleges filed any type of report and 32.2 per cent reported tuberculosis programs. It is believed that both of these figures will show rather marked improvement during the next few years.

NEW CASES OF TUBERCULOSIS

There were 286 colleges which reported case-finding programs during 1943-44. This is an increase of 19 over last year. The reports from four colleges give incomplete data and their results are not included in this summary. Of 282 colleges with programs, 199 include a tuberculin testing routine and 83 employ chest roentgenograms without preliminary testing. Of special interest, we believe, is the significant increase in the number of students found to have tuberculosis in 1943-44 as compared with the previous year. The enrollment at those colleges conducting case-finding programs in 1942-43 was 406,626. They reported 522 newly discovered cases of tuberculosis, a rate of 128.3 cases per 100,000

*The report which appears here was not printed in Journal-Lancet annual Tuberculosis Issue for April 1945 because of delay in compilation of returns made by the colleges to the National Tuberculosis Association on their case-finding programs.

enrolled students. During the past school year, student enrollment at those institutions having survey programs was 286,018. Yet 622 new cases of tuberculosis were diagnosed, a rate of 217.4 per 100,000. This represents an increase of 16 per cent in the number of new cases of tuberculosis found in a student population which was 29 per cent below that of the previous year. It would seem that this reflects considerable improvement in the quality and effectiveness of case-finding procedures at many of our colleges. At many institutions the original tuberculosis program was frequently limited to entering students, whereas in recent years an increasing number have been able to extend their surveys so as to include the entire student body.

There are now 93 universities and colleges which are conducting what may be considered practically ideal programs of tuberculosis control among their students. Seventy-four colleges do routine tuberculin testing and x-ray all positive reactors each school year. Nineteen colleges report that chest x-rays are provided for all students annually, they having dispensed with preliminary testing. Although some of us prefer to have the additional information acquired through the use of the tuberculin test, certainly the programs of both of the above groups of colleges offer a high degree of protection to their students. Cases of advanced tuberculosis among students at these 93 institutions should be encountered very rarely indeed, with such close supervision provided throughout the entire college course.

Reports were received from 114 colleges which do not sponsor any type of tuberculosis program. Student enrollment at these institutions was 121,133. There were 14 students found to have tuberculosis, a rate of 11.5 per 100,000. On the basis of this year's experience, therefore, colleges with case-finding programs diagnosed 18.9 cases of tuberculosis for each case diagnosed at those schools having no program. Surely such evidence should leave no doubt as to the wisdom and value of employing modern case-finding methods in every college.

Of the 622 cases of tuberculosis diagnosed during the year at those colleges having case-finding programs, the lesions were classified as unstable in 156, quiescent in 151 and 315 were designated as healed. Students withdrawing from college to undergo treatment numbered 169. Ninety students were reported to have entered sanatoria for treatment. And again worthy of emphasis, as in previous reports, is the fact that 319 students returned to college after successful treatment of their disease. This provides the best possible proof of the value of early diagnosis and prompt treatment of tuberculosis in the young adult.

The committee again believes it advisable to emphasize the need for active treatment in the majority of cases of tuberculosis found among young men and women of college age. Of the 622 new cases of tuberculosis among

students, 453 were permitted to remain in college. This is 72.6 per cent of all new cases diagnosed during the year. It seems highly probable that a considerable proportion of this group may experience progression of their disease and will eventually have to undergo treatment. It is known that considerable time may elapse between the development of a new, unstable tuberculous lesion and the appearance of symptoms. Certainly every student who is found to have tuberculosis of recent development should be given the advantage of early treatment. It is not unusual to see almost complete regression and clearing of the minimal, exudative type lesion within a period of six to eight months where treatment at bed rest is instituted before the advent of any symptoms. Reisner and Downes¹ recently reported observation of 469 persons having minimal lesions of pulmonary tuberculosis. All patients were ambulatory and were observed over periods of from two to ten years. Among persons under 25 years of age, 59 per cent of those whose lesions were classified as exudative or exudative-productive at the time of first diagnosis, showed progression of their disease. They found, too, that the risk of progression was highly concentrated within the first year after the diagnosis of tuberculosis. Soper and Amberson² advocated prompt treatment for students with minimal tuberculous infiltrations and suggested close supervision of those cases in which the stability of the lesion was in doubt. They state as follows: "The treatment of pulmonary tuberculosis discovered among students requires discrimination, judgment and experience on the part of the physician. Manifestly active cases should be put under treatment at once. In other instances, symptoms are vague or lacking, yet the small pulmonary infiltrations are potentially dangerous and should also be treated promptly and strictly. Only when the lesion is judged to be stable and fibrotic is it justifiable to postpone treatment pending a period of observation. In every case, observation should be at frequent intervals, at first with a roentgenogram every two to three weeks and close clinical study until the stability of the lesion is determined. Apparently stable lesions should be followed with roentgenograms for many years, at first every three months, and never less than once a year."

The college which is attempting to protect its students against tuberculosis should give some thought to the possible dangers of non-student contacts. During the past year, 127 schools provided some type of supervision for their food handlers, while 169 schools reported procedures involving faculty members and various employee groups. The reports indicate that food handlers receive more regular and more complete supervision than do other employees or faculty members. Yet thirty colleges carry out routine testing or x-raying of faculty members, many of these on an annual basis. A few schools report regular supervision of faculty members under 35 years of age, while others specify that those under 30 years are surveyed every year or every two years. During the year there were 59 cases of tuberculosis diagnosed among faculty members and other employees and 18 cases among food handlers. Since the number of food handlers employed by a college is relatively small in com-

parison with the student enrollment, no great expense is involved in providing annual chest x-rays for this group. Of special interest to the committee is a recent communication from an eastern college in which the college physician stated that beginning in 1945-46 this institution was requiring all faculty members, employees and students to have an annual chest x-ray. They have never previously sponsored any type of tuberculosis program. Their initial effort is, therefore, highly commendable in that every person connected with the institution will be included in the program of annual chest x-rays.

TUBERCULIN TESTING PROCEDURES

Each year the committee receives numerous inquiries concerning the validity of the tuberculin test, testing dosage and choice of materials and technics. We must again recommend that the Mantoux method be employed whereby an accurately measured dose of tuberculin is injected intradermally. As to the material, we suggest Purified Protein Derivative—P.P.D.—as first choice. This product permits more uniform standardization, and testing results, as reported by a large number of colleges in all sections of the country, are more nearly comparable. It should be remembered that P.P.D., when made up into the usual testing dilutions, deteriorates very rapidly. It is suggested, therefore, that colleges using this material prepare fresh dilutions daily in order to obtain accurate results. When not in use the solution should be kept under refrigeration. Old Tuberculin is used by 58 institutions and may be relied upon for satisfactory results when supplied by a reputable manufacturer. Quite a number of colleges use the Old Tuberculin prepared by the Saranac Laboratories, Trudeau, New York.

Among 116 colleges reporting the use of the Mantoux test, 33 employ the two dose technic, 32 a single large dose, 23 a single intermediate dose and 28 use a single small dose. Reports by various workers indicate that positive reactions will be obtained to relatively small doses of tuberculin in the presence of recent or significant tuberculous infection or disease. However, approximately 20 per cent of reactors will be missed if only the usual first testing dose of 0.01 mg. O.T. or 0.000,02 mg. P.P.D. is used. It is suggested, therefore, that the regular two dose method be practiced wherever possible.

Fifty-four institutions reported using the Vollmer patch test during the past year. The incidence of positive reactions reported by this group of colleges was significantly lower than that obtained by colleges using the Mantoux method. Table 1 presents the results obtained through use of the Patch test as compared with the Mantoux method employing a single small dose and the regular two doses of tuberculin. Among 9,625 students tested with the patch test there were 8.7 per cent positive reactors. This is less than one third, 31.8 per cent, of the reactions reported when the usual two doses of Old Tuberculin or P.P.D. were used. Those schools which used a single small dose of tuberculin reported 37.5 per cent more positive reactors than did those using the patch test. Since this method is being employed at an increasing number of colleges each year, the various discrepancies which may attend its use among college

students should be kept in mind. For accurate results the tuberculin incorporated in the patch must be in close apposition to the skin for a period of forty-eight hours. Moisture, as from perspiration or from bathing, may readily cause detachment of the adhesive from the skin, dilute the tuberculin and thus render the test valueless. It would seem that in an average college group a considerable proportion of students will not refrain from physical activities which will cause some degree of perspiration. Others will be reluctant to give up their daily showers in spite of the most urgent warning at the time of applying the test. It is known, too, that students have, as a prank, removed the patch material soon after its application, only to reapply it before reporting for a reading. It is quite possible, therefore, that a student with significant pulmonary tuberculosis might be in one of the above groups and have the misfortune to be recorded as negative to tuberculin. At many colleges this student would not be included in the group being given chest x-rays since it is common practice to x-ray only those positive to tuberculin.

Numerous pediatricians have reported highly favorable results with the patch test when used under ideal conditions in young children. Hughes³ applied the patch test and P.P.D. to a large group of children and sums up his results as follows: "Seventy-eight per cent of all the tuberculin sensitive patients would have been detected by testing with the first strength solution of P.P.D. alone; 89 per cent would have been detected by the patch test alone; and the remaining 11 per cent would have been detected by the second strength solution of P.P.D." Stewart⁴ tested 96 children and 90 showed conformity between the patch test and the Mantoux test using 0.1 mg. O.T. Kereszturi⁵ of the department of pediatrics, Columbia university, expressed this opinion: "It is clear that the period has not yet arrived when the time-proven Mantoux test can be replaced by an equally reliable contact test." If, as appears likely, a considerable number of colleges continue to use this method of tuberculin testing, it is suggested that the various factors which may contribute to inaccurate results should be guarded against in every way possible. Some persons who show no evidence of reaction, when the patch test is removed after forty-eight hours, will develop reactions somewhat later. It is therefore advisable to make a final reading forty-eight hours after removal of the adhesive tape in all cases showing no reaction or a questionable reaction, at the time of the usual first reading.

Inquiries concerning the validity of the tuberculin test are received by the committee quite frequently. Typical

TABLE 1
Results of Tuberculin Tests in College Students, 1943-44

	Number of Students Tested			Percentage of Positive Reactions		
	Male	Female	Total	Male	Female	Total
Two-Dose Method						
Up to 1.0 mg. O.T. or 0.005 mg. P.P.D.	2,865	9,144	12,009	33.8	25.3	27.3
Single Small Dose O.T. & P.P.D.	2,252	6,150	8,762	16.7	12.9	13.9
Patch Test	2,452	7,173	9,625	12.0	7.6	8.7

TABLE 2
Questionnaire Survey of Tuberculosis Case-Finding in American Colleges and Universities, 1943-44

	Institutions Contacted	Replies Received	Programs Reported
Maine	8	3	3
New Hampshire	7	3	3
Vermont	9	4	4
Massachusetts	43	26	21
Rhode Island	6	4	4
Connecticut	12	6	3
	85	46	38
New York	68	27	19
Pennsylvania	64	33	24
New Jersey	18	15	11
Delaware	1	0	
Maryland	17	5	4
District of Columbia	9	5	3
	177	85	61
Virginia	18	8	4
North Carolina	21	13	8
South Carolina	15	2	1
Georgia	16	2	2
Florida	7	3	1
	77	28	16
Texas	33	7	3
Oklahoma	16	3	2
Arkansas	11	4	4
Tennessee	27	4	3
Mississippi	9	2	1
Alabama	13	2	0
Louisiana	13	1	0
	122	23	13
North Dakota	9	1	1
South Dakota	8	6	4
Minnesota	22	19	18
Wisconsin	27	14	12
Michigan	25	16	12
Ohio	46	26	19
West Virginia	14	10	8
Indiana	27	17	15
Illinois	45	23	15
Iowa	26	7	3
Nebraska	16	6	1
Kansas	21	10	9
Missouri	25	14	7
Kentucky	17	5	4
	328	174	128
Montana	6	2	1
Idaho	3	2	0
Wyoming	1	1	1
Nevada	1	0	-
Utah	4	1	0
Colorado	9	7	4
Arizona	3	1	1
New Mexico	5	2	1
	32	16	8
Washington	16	5	5
Oregon	14	6	5
California	35	17	12
	65	28	22
Grand Total	886	400	286
Previous Year	879	398	267
Two Years Ago	860	488	311
Three Years Ago	854	483	304
Four Years Ago	877	475	248
Five Years Ago	857	282	165
Six Years Ago	852	238	133

of these is such a question as, "May we not miss actual cases of pulmonary tuberculosis if we x-ray only those students who react to tuberculin?" Numerous workers have called attention to the high degree of sensitivity to tuberculin found so constantly in persons having significant tuberculous disease. Furcolow⁶ and his co-workers reported quite intensive and detailed studies of tuberculin reactions in a large number of children and adults using various dosages of P.P.D. They found that

TABLE 3

New Cases of Pulmonary Tuberculosis Diagnosed Among College Students, 1943-44

Institutions with SOME Organized Tuberculosis Program:	
No. of cases diagnosed as unstable	156
No. of cases diagnosed as quiescent	151
No. of cases diagnosed as healed	315
Total new cases reported	622
No. of students who left college because of tuberculosis	160
No. of students returning to college having undergone treatment for tuberculosis	308
No. of institutions reporting	286
Approximate total enrollment	286,018
New cases per 100,000 students	217.4
Institutions with NO Organized Tuberculosis Program:	
No. of cases diagnosed as unstable	4
No. of cases diagnosed as quiescent	3
No. of cases diagnosed as healed	7
Total new cases reported	14
No. of students who left college because of tuberculosis	9
No. of students returning to college having undergone treatment for tuberculosis	11
No. of institutions reporting	114
Approximate total enrollment	121,133
New cases per 100,000 students	11.5
Total Cases of Pulmonary Tuberculosis Diagnosed 1943-44:	
Student cases newly diagnosed	636
Food-handlers	19
Faculty, administrative officers, employees, etc.	61
Total new cases	716

adults are slightly less sensitive in their response to tuberculin than children. Among children with a history of contact with tuberculosis, 77 per cent reacted to a dose of P.P.D. which was slightly less concentrated than the usual first testing dose. At this same dosage level, only 6.5 per cent of children with no history of contact gave positive reactions. They summarize their results as follows: "From these observations it appears that most persons with tuberculosis react to a relatively small dose of tuberculin, about 1/10,000 mg. of P.P.D. as was used in this study. In our experience with over 500 cases of tuberculosis, more than 99 per cent reacted to this dose, which is five times more concentrated than the usual first testing dose of P.P.D. Patients with active tuberculosis, both adults and children, who are anergic to tuberculin were not encountered in this study."

The validity of the tuberculin test in cases of significant or recent tuberculous infection and disease is also emphasized by Long.⁷ Among 610 cases of pulmonary tuberculosis diagnosed at the Henry Phipps Institute during a five year period, only one of this number failed to react to tuberculin. Among the 609 reactors it is noteworthy that 94 per cent of the white and 96 per cent of the colored patients reacted to the first small dose. In observing 2,490 patients over a ten year period, all of whom were originally positive reactors, there were no instances in which the reaction became negative in frank cases of reinfection type pulmonary tuberculosis. There were, however, a few examples of cessation of reacting power in patients with old scarred, latent apical tuberculosis or childhood type tuberculosis.

At the University of Pennsylvania, the writer applied extremely small doses of tuberculin to medical students who were found to have recently developed tuberculous lesions, all of whom had negative chest findings by x-ray six months to one year previously. Dilutions of 1-1,000,000 and 1-500,000 O.T. were employed. Forty per cent

TABLE 4

Testing Technics in 199 Colleges Reporting Tuberculin Testing Programs, 1943-44

Testing Method:	
Mantoux intradermal	125
Vollmer patch test	54
Pirquet	1
Combination Patch and Mantoux	3
Unspecified	16
Testing Material:	
Purified Protein Derivative	61
Old Tuberculin	58
Unspecified	23
Combination of P.P.D. and O.T.	3
Testing Dosage:	
Two-dose technic	33
Single large dose	32
Single intermediate dose	23
Single small dose	28
Combination of dosage	1
Unspecified	28
Testing Routine:	
All new students, negative reactors annually	49
All new students, all seniors	26
Test optional, available to all annually	29
New students only, no re-testing	40
Other testing routine	34
Unspecified	21

of this group reacted to the higher dilution, or a dose of 0.0001 mg. of O.T. This is one one-hundredth of the usually employed first test dose. Of the remainder, none failed to react to the 1-500,000 dilution. A high degree of sensitivity to tuberculin was therefore present in this group of students, all of whom presented pulmonary lesions of recent development which were active and unstable.

At the same institution only one case of the adult or reinfection type tuberculosis has ever been encountered in a student who did not react to the usual test doses of Old Tuberculin. In this student the lesion in the lung parenchyma was quite characteristic of a densely fibrotic and well stabilized process. Apparently, healing had been so complete in this case that all viable bacilli had been eliminated. Tuberculin sensitivity had thus been lost, since tuberculoprotein was no longer being liberated from this healed focus of disease. In the college age group, therefore, instances will undoubtedly be rare indeed where the individual with significant tuberculous disease will not react to the test doses of tuberculin usually employed in the Mantoux method.

The probability of a person becoming sensitized to tuberculin following repeated testing with Old Tuberculin or P.P.D. is sometimes mentioned in the reports of those colleges which retest all negative reactors on an annual or semi-annual basis. Siebert^{8,9} has demonstrated that Old Tuberculin and P.P.D. are non-antigenic and do not produce skin sensitivity. Nelson, Mitchell and Brown¹⁰ suggest that sensitization in certain reported studies may have been due to substances in the culture media and not to products of the tubercle bacillus. They applied repeated tests to a large number of children, using both P.P.D. and Old Tuberculin. In one group, ten tests were given to each child over a period of 211 days and in another fourteen tests over a period of 379 days. As a result of their observations they concluded as follows:

"Within the limits of the amounts of tuberculin injected in the various tests of this study, there appears to be no evidence that tuberculin sensitization is induced by

TABLE 5
X-Ray Procedures Reported by Various Institutions, 1943-44

199 Colleges Reporting Tuberculin Testing Programs:	
Positive reactors filmed once only	46
Positive reactors filmed annually (or oftener)	74
X-ray optional (acceptance quite general)	25
X-ray optional (acceptance not satisfactory)	5
Other X-ray routine	17
Fluoroscope used to supplement routine x-ray	27
Fluoroscope used exclusively (chest x-ray when indicated)	8
83 Colleges Reporting No Tuberculin Testing Program:	
Chest x-ray for all new students	25
Chest x-ray for all students annually	19
Other routine x-ray programs	32
Routine not reported	7

tuberculin injection in man. This does not imply that sensitization to tuberculin or tuberculo-protein is impossible, but does indicate that such sensitization will probably not occur from the ordinary use of tuberculin for skin testing purposes."

The committee believes there is ample evidence to justify the following statements relative to case-finding procedures commonly employed among college students.

1. The incidence of tuberculous infection among college students is steadily decreasing. The majority of reports from colleges in 1943-44 indicate infection rates varying between 15 and 30 per cent.

2. The two dose Mantoux method is recommended as the method of choice for tuberculin testing. If a single test dose is employed, an intermediate dose of at least 0.1 mg. O.T., or 0.0001 mg. P.P.D. should be used. The Vollmer patch test cannot be recommended for use in colleges.

3. The Mantoux test is highly dependable in eliciting sensitivity due to significant tuberculous infection or disease. It is sound practice, and in the interests of economy, to provide chest roentgenograms for only those students who react to an adequate dose of tuberculin.

4. Complete protection against tuberculosis for college students cannot be attained through a program limited to the student body. Faculty members and employees, including food-handlers, should participate in the tuberculosis control program on the same basis as students.

5. The lesions of pulmonary tuberculosis encountered in college students are, in a majority of instances, unstable and potentially dangerous. The absence of symptoms does not preclude the necessity for early treatment. Students who remain in college having pulmonary lesions, should be under close observation with frequent clinical and roentgenographic studies.

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Abridged Statement of Extraordinary State Committee of U.S.S.R.* (Covering Medical Aspects Only) for the Ascertaining and Investigation of Crimes Committed by the German-Fascist Invaders and Their Associates in the Oswiecim Death Camp

(July 5 there appeared in the press, under Munich and Prague datelines, stories of Bavarian and Czechoslovakian "hospital" camps conducted by the Nazis, in one of which child prisoners were subjected to guinea-pig treatment in "scientific starvation." Coming on the heels of other comparable revelations, the JOURNAL-LANCET deems the medical portion of the Russian report of sufficient importance to physicians of the United States to warrant publishing.)

THE Oswiecim camp was built in 1939 on orders from SS Reichsfuehrer Himmler, especially for the destruction of enslaved citizens of the occupied countries of Europe. The camp occupied a huge area around the city of Oswiecim and consisted of a whole chain of camps: Auschwitz, Birkenau, Monowice, Golesau, Jawisowic, Neidachs, Blechamer, and others. From 180,000 to 250,000 prisoners were always confined in the camps at Oswiecim.

On the basis of interrogation and medical examination of 2,819 prisoners of Oswiecim camp who were saved

*From the issue of May 29, 1945 (Vol. V, No. 54), Information Bulletin of the Embassy of the Union of Soviet Socialist Republics, Washington, D. C.

by the Red Army; a study of German documents discovered in the camp; the remains of the crematorium and gas chambers blown up by the Germans as they retreated; bodies found on the territory of the camp, and belongings and documents found in camp warehouses and barracks of the people from various countries of Europe who were killed by the Germans, it has been established that:

1. German professors and doctors conducted in the camp so-called "medical" experiments on living men, women and children.

2. In the degree of premeditation, technical organization, and mass scale and cruelty of murder, the Oswiecim camp leaves far behind all German death camps known hitherto.

Special hospitals, surgical wings, histological laboratories and other institutions were established at the camp, but they existed not to treat people, but to kill them. German professors and doctors carried out wholesale

experiments on perfectly healthy men, women and children in these institutions. They conducted experiments in sterilizing women and castrating men and boys, in infecting large numbers of people with cancer, typhus and malaria, conducting observations upon them; they tested the action of poisons on living persons.

MEDICAL EXPERIMENTS ON LIVING PEOPLE

In Oswiecim camp the German-fascist professors and doctors widely practiced medical experiments on living persons, displaying monstrous inventiveness.

Among the prisoners saved by the Red Army, Doctors Steinberg of Paris, Gordon of Vilnius, Professor Grossman of Yugoslavia, Ervin Valentin of Berlin, Anna Keppich of Hungary, Edward Devind of Holland, and Albert Flechner of Paris, stated that they had been eyewitnesses to a vast number of medical experiments on camp prisoners by German-fascist professors and doctors.

Surgical operations were performed at the caprice of the German doctors to practice operation technique. Koenig, a young German doctor, selected prisoners with inflammatory processes in the extremities, and practiced amputation. The German doctors Tillo and Fischer assembled large numbers of prisoners, and with no cause performed hernia operations on them. At the slightest complaint of a stomach pain, Enders, head doctor of the hospital, practiced operating on an ulcer of the stomach.

Experiments on women were conducted in the hospital wards of the Auschwitz camp. Up to 400 women prisoners were confined in the tenth wing of the camp where experiments were carried out on sterilization by x-ray and subsequent removal of ovaries; on transplanting cancer to the cervix of the uterus; on forced childbirth, and on testing substances for roentgenography of the uterus.

In wing No. 28, experiments on inflicting skin injuries with kerosene, various salts, pastes and powders were performed on prisoners. Here also akrichine was used with the purpose of studying invoked jaundice. These experiments were performed by Doctor Emil Koschub.

On instructions from the Extraordinary State Committee, in the course of February and March, 1945, the prosecution department of the First Ukrainian Front carried out jointly with D. I. Kudryavtsev and T. Kuzmin, representatives of the Extraordinary State Committee, a thorough investigation of German crimes in the Oswiecim camp.

The following special commissions of experts took part in the investigation:

A Medico-Legal Commission made up of F. F. Bruzhin, Chief Medico-Legal Expert of the First Ukrainian Front; M. G. Schursanov, Medico-Legal Expert of the Army; I. I. Pertsov, therapist; N. A. Lebedev, Chief of the Laboratory of Pathological Anatomy of the Army; G. A. Kolegayev, gynecologist of the Army; N. R. Vannovsky, psychiatrist; N. I. Gerasimov, criminologist; and prisoners of the camp B. V. Epstein, Professor of Pediatry, Director of the Clinic at Prague University; G. G. Limousin, Professor Pathological Anatomy and Experimental Medicine of the city of Clairmont-Ferrand, France, and M. J. Grossman, Docent of the School of

Medicine in Zagreb, Yugoslavia; and a Technical Commission made up of Professors Roman Dawidowski and Jaroslaw Dolinski of Cracow; engineer V. F. Lavrushin, Candidate of Chemical Sciences, and engineer A. M. Shuer.

In wing 21, wholesale experiments were performed in castrating men with the purpose of studying the possibility of sterilization by x-ray. Castration was carried out at a definite interval after the rays had been employed. Professor Schuman and Doctor Dering engaged in such experiments with x-rays and castration. Not infrequently the operations consisted in removing one or both testicles for study after the person had been x-rayed.

All these facts are confirmed as well by ex-prisoners of the camp: Judith Klein, Klara Ausen, Mina Garbman, Nona Sonders, Jakob Skurnik, David Sures, and many others upon whom the German doctors carried out one or another experiment.

On orders from Enders, chief German doctor, between 1941 and 1944 prisoners in the camp hospital were put to death by injections of phenol into the heart. The first injections were made by the doctor and later ones by orderlies. The German Kler, a former shoemaker, particularly distinguished himself in this field by killing thousands of victims. A Polish prisoner by the name of Panszczik did 12,000 persons to death by phenol injections (subsequently he was killed by Polish prisoners themselves). Stess, a German, murdered 10,000 persons by such injections.

The facts of the inhuman experiments on prisoners are also confirmed by a number of documents found in the camp office. A report of the surgical department of the camp hospital records that in three months between October and December, 1943, surgeons of the department carried out, among other operations, the following: 89 testicle amputations (castration), 5 sterilizations, 5 removals of ovaries.

In telegram No. 2678, dated April 28, 1943, Colonel Sommer, SS Obersturmfuehrer, instructed the office of the camp commandant to list 128 women under the heading "prisoners for experiments." In a discovered "statistical review by the camp commandant of the number of women prisoners and their distribution in various categories," signed by Sell, assistant camp commander, there is a permanent heading, "Prisoners intended for various experiments." Recorded under this heading are 400 "women under experiment," on May 15, 1944; 413 on June 5, 1944; 348 on June 19, 1944; 349 on July 30, 1944, etc.

German doctors played a leading role in selecting the prisoners for gassing and cremation. They conducted the selection everywhere: near crematoriums, in hospitals, and in barracks. The weak, sick, and disabled were dispatched to the gas chambers by the German doctors. The following German doctors engaged in selecting prisoners for annihilation: Wirtz, Mengele, Rode, Fischer, Tillo, Kitt, Koenig, Klein, and many others.

On orders from Wirtz, head German doctor of the Oswiecim chain of camps, during the typhus fever epidemics, inmates of entire barracks were put to death by means of gas asphyxiation.

The Medico-Legal Commission has established that German doctors in Oswiecim carried out the following experiments on living persons:

1) Mass resection of tissue of cervix of the uterus, or even complete removal of the latter.

2) The testing of a number of unknown substances for roentgenography of the uterus and fallopian tubes. With special instruments these substances were injected under pressure into the cavity of the uterus, which frequently entailed excruciating pain for the victims upon whom the experiments were performed.

3) Sterilization of women by x-raying the pelvic region, with subsequent opening up of the abdomen and removal of the ovaries. These experiments were carried out chiefly on young women.

4) A study of the action of various chemical preparations, by orders of German firms. Doctor Erwin Valentini, a German, testified that there was a case when Glauber, a gynecologist from Koenigshuette, and Gebel, a chemist, representatives of the chemical industry of Germany, bought 150 women from the camp management for such experiments.

5) Sterilization of men by x-rays.

6) Experiments on men involving the application of irritants to the skin or shin to evoke ulcers and phlegmon.

7) A number of other experiments, such as infection with malaria, artificial insemination and the like.

A great many of the experiments ended in a rapid and torturous death for the prisoners. After the prisoners had been fully utilized for experiments, they were killed and cremated. By this means the Germans strove to remove witnesses to their inhuman experiments.

Ex-prisoner Samuel Abramovich Stern, a resident of the city of Bucharest, who was interrogated as a witness, testified: ". . . I worked in Auschwitz camp as a male nurse. On orders from Oberfeldwebel Koschub I made injections and did other things to prisoners. I know for a fact that kerosene was injected under the skin of the shin on many patients . . . A second method of experimentation was chemical irritation of the skin. Used for this purpose was an 80 per cent solution of aluminum acetate. After this, a whole layer of skin was removed and sent for analysis. In cases of deep irritation of the skin, part of the flesh was cut out together with the skin and sent for analysis. Koschub also invoked jaundice and performed transfusion operations with the blood of malaria patients."

M. Valigura, who was subjected to experiments, stated ". . . Several days after I had been brought to Birkenau—it seems to me it was in the beginning of December, 1942—all young men between the ages of 18 and 30 were sterilized by subjecting the scrotum to x-rays. I was among those sterilized. Eleven months after I had been sterilized, that is, November 1, 1943, I was subjected to castration . . . 200 other persons were subjected to sterilization on the same day as I . . ."

Witness David Sures of the city of Salonika, Greece, gave the following testimony. ". . . About July, 1943, I and 10 other Greeks were registered in some sort of a list and sent to Birkenau. There we were stripped and

subjected to sterilization by x-rays. A month after sterilization we were summoned to the central section of the camp, where all who had been sterilized were subjected to a castration operation. . . ."

Ex-prisoner M. Hauser (Nine, Cite Milton, Paris) stated ". . . In Auschwitz we were placed in the tenth wing. We did not know why we had been taken there. This wing contained the hospital section and we were all perfectly healthy women . . . At first in the tenth wing they took a blood sample from me; for what purpose I don't know. At the end of August, 1943, I was taken to the operating room and anesthetized, and an operation was performed on my genital organs. The operation was performed by Doctor Samuel, a prisoner, under the supervision and on the instructions of the German doctor Wirtz. After this operation, I lay ill for 11 months in the tenth wing. Among those who were sterilized was a Jewess from Greece named Bela. I don't know her last name. After x-rays her abdomen was cut open lengthwise. After the operation she recovered and the wound on the abdomen healed. The German doctor Schuman came to the tenth wing and as a control case took Bela to the twenty-eighth wing and then cut open her abdomen crosswise. I myself saw the crosswise cut on her abdomen. Several days later, Bela died."

It has been established by investigation that from three to five trains, each carrying between 1,500 and 3,000 people destined to be done to death, arrived every day in Oswiecim. The victims were brought from all countries of Europe. Among the 2,819 prisoners released from the Oswiecim camp and subjected to examination by the Medico-Legal Commission were 745 from Poland, 542 from Hungary, 346 from France, 315 from Czechoslovakia, 180 from the USSR, 159 from Holland, 143 from Yugoslavia, 91 from Italy, 76 from Greece, 52 from Rumania, and 41 from Belgium.

Between 200 and 500 of the more able-bodied were chosen from each trainload for various work in the camp; the rest were sent straight to the gas chambers and crematoriums.

As has been established by the investigation, besides the persons used for the purposes of experiments, some 200,000 prisoners were kept permanently in the Oswiecim camps for exploitation in all kinds of hard labor. Persons thus occupied were driven to a state of extreme exhaustion, after which, being unfit for work, they were done away with.

The Medico-Legal Commission which examined 2,819 Oswiecim prisoners rescued by the Red Army established that 2,189, or 91 per cent, were suffering from extreme physical exhaustion, while 223 had tuberculosis of the lungs. It was likewise established that the Germans had subjected the prisoners to physical torture, as a result of which the Commission found the people suffering from broken ribs, limbs, spines and facial bones, also various wounds, ulcers, and frozen hands and feet. Very many of the released prisoners are suffering from serious nervous and psychiatric ailments.

The Medico-Legal Commission performed autopsies on 536 bodies of prisoners found in various parts of the territory of the camps. It has been established that in

474 cases (88.3 per cent) death resulted from exhaustion.

Hundreds of thousands of children, from infants to 16-year-olds, were slaughtered by the Hitlerites in Oswiecim camp. As a rule, children who arrived by train were immediately sent to the gas chambers. Only a few healthy juveniles were retained for work in the camps.

Investigation has established that children between the ages of 8 and 16 were forced to perform hard physical labor along with adults. Heavy labor, torture and beatings soon reduced the children to a state of complete collapse, whereupon they were murdered.

Doctor Jacob Gordon, a former prisoner from Vilnius, testified: "In the beginning of 1943, 164 boys were selected in the Birkenau camp and taken to a hospital, where they were done to death by injection of carbolic acid into the heart."

TESTIMONY OF CHILD PRISONER

Andreas Lerinciakos, a nine-year-old boy from Cles, Hungary, testified: "When we were taken to Wing No. 22 in the camp we were beaten by German women who were put in charge of us. They beat us with sticks. While I was in the camp, Doctor Mengele took my blood many times. In November, 1944, all the children were transferred to camp A, the 'gypsy' camp. When they counted us, one was found missing, so Branden, manageress of the women's camp, and her assistant, Mendel, drove us out into the street at one o'clock in the morning and made us stand there in the frost until noon the next day."

Children born in camp were taken from their mothers by the SS and put to death. Pregnant women among new arrivals were immediately sent to a special barrack where premature birth was induced. Women who resisted were sent at once to the gas chamber.

Sofya Isakova Flax, an ex-prisoner from Cracow, testified: "Many of the women who arrived in August, 1944, had children aged between 5 and 12. All of them, together with their mothers, were sent to the crematoriums. I was in the seventh month of pregnancy when I arrived. SS Doctor Koenig, who examined me, sent me to barracks V-3, Birkenau. There were 65 women there in a similar condition. Three days later I was given an injection in the hip to induce premature birth. The injections were made four days in succession. On the fifth day I gave birth and my child was taken away. There were 14 similar cases while I was in the barracks. No one knew where the infants were taken."

Among the prisoners released from Oswiecim and examined by physicians were 180 children, including 52 aged 8, and 128 between the ages of 8 and 15. All of them arrived in camp in the second half of 1944, which means that they spent from three to six months in the camp. A medical examination of these children established that 72 of 180 are suffering from lung and glandular tuberculosis, 49 from alimentary dystrophy, 31 from frostbite, etc.

In the Oswiecim camp the German exterminated tens of thousands of prominent scientists and representatives of the intelligentsia of different countries.

Andre Foudrie, from the town of Samot Dipuen, told the Commission the following: "Most of the 600 Frenchmen with whom I arrived in the camp perished within a few months. Among them were Emil Bureau, economist; Professor Joan of the Lyceum of Compiegne; Philippe Geronne, deputy from the Department of Lot; Lebigoux, Mayor of the town of Villevit; Godeau and Broux, schoolteachers; Molyneux, architectural engineer, etc."

Professor Henri Limousin of Clairmont-Ferrand University, stated: "In November, 1944, I was taken from Dachau camp and sent to Oswiecim as a specialist on pathology. I spent about a month here in the quarantine block, where I was made to clean lavatories, wash floors and carry food to prisoners in jail."

Among those murdered in the Oswiecim camp were Professor Freyda, well-known Dutch economist; Doctor Lawoslaw; engineer Kimar; Doctor Endoklyan, an engineer from Yugoslavia; Wisniewski, a Polish engineer; Teichert, a pharmacist from Warsaw; Polish professors Geszickiewicz and Rubarski; Czechoslovak professors Otto Sitik, neuropathologist, Leo Tausik, psychiatrist, Jan Levit, surgeon; Kraus, a famous lawyer from Vienna; Doctor Jaube, a French army doctor with the rank of general, and many, many others. They were all tortured to death by hard labor, or else suffocated in gas chambers.

The commission of technical experts established that during the existence of the Oswiecim camp the German executioners killed in it no less than four million citizens of the USSR, Poland, France, Yugoslavia, Czechoslovakia, Rumania, Hungary, Bulgaria, Holland, Belgium and other countries.

The monstrous crimes committed by the Germans in the concentration camps of Oswiecim were perpetrated in keeping with the directives issued by the Hitlerite government and were under the leadership of hangman Himmler, Reichsfuehrer of the SS and Police. The immediate executors of the crimes were Lieutenant General of SS and Police Glueks, Chief of Camps of all Germany; General of SS and Police Pohl, Chief of the Central Sanitary Administration of Concentration Camps; SS Major General Kammler, Chief of Concentration Camp Construction; Oberscharfuehrer Palitsch, SS Obersturmfuehrer Sommer, and 27 other officers (all named in the report); camp doctors Major Doctor Schmitt, in charge of experiments; Obersturmfuehrer Doctor Mengele; Untersturmfuehrer Koenig, Rotenfuehrer Rode, Obersturmfuehrer Doctor Fischer, Obersturmfuehrer Doctor Klein, Doctor Dering, Hauptsturmfuehrer Doctor Wirtz, Obersturmfuehrer Doctor Tillo, Sturmbannfuehrer Doctor Klauberg, Professor Schuman, Doctor Waber, Oberfeldwebel Emil Koschub, Obersturmfuehrer Enders, Hauptsturmfuehrer Doctor Geotmerman, Hauptsturmfuehrer Doctor Kitt, Hauptsturmfuehrer Doctor Horstman, and Hauptsturmfuehrer Doctor Kraus.

All these persons, just as all those Germans who personally participated in the murder and torture of the prisoners of Oswiecim, must be brought before the court of nations and pay the severe penalty they merit.

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STANDING COMMITTEES

SCIENTIFIC WORK

WM. DUNCAN, M.D. Webster

F. S. HOWE, M.D. Deadwood

R. G. MAYER, M.D. Aberdeen

PUBLIC POLICY AND LEGISLATION

WM. DUNCAN, M.D. Webster

F. S. HOWE, M.D. Deadwood

THE COUNCIL

PUBLICATIONS

R. G. MAYER, M.D. Aberdeen

THE COUNCIL

MEDICAL DEFENSE

C. J. McDONALD, M.D. (1946) Sioux Falls

G. W. MILLS, M.D. (1947) Wall

W. G. RIEB, M.D. (1948) Parkston

MEDICAL EDUCATION AND HOSPITALS

E. M. STANSBURY, M.D. (1946) Vermillion

GEOFFREY COTTAM, M.D. (1947) Sioux Falls

J. L. CALENE, M.D. (1948) Aberdeen

PUBLIC HEALTH

A. TRIOLO, M.D. (General Chairman)

Sub-committee on Cancer

O. S. RANDALL, M.D. (1948)

R. E. JERNSTROM, M.D. (1946)

GILBERT COTTAM, M.D. (1947)

Sub-committee on Tuberculosis

W. L. MEYER, M.D. (1946)

D. S. BAUGHMAN, M.D. (1948)

Sub-committee on Mental Hygiene and Child Welfare

M. W. PANGBURN, M.D. (1946)

F. W. HAAS, M.D. (1947)

J. D. BAILEY, M.D. (1948)

Sub-committee on Syphilis Control Program, U.S.P.H. Service

GILBERT COTTAM, M.D. (1946)

F. J. TOBIN, M.D. (1947)

ANTON HYDEN, M.D. (1948)

Pierre

Watertown

Rapid City

Pierre

Sanator

Madison

Miller

Yankton

Rapid City

Pierre

Mitchell

Sioux Falls

NECROLOGY

J. A. HOHF, M.D. (1946)

MAGNI DAVIDSON, M.D. (1947)

W. G. MAGEE, M.D. (1948)

Yankton

Brookings

Watertown

MEDICAL BENEVOLENCE

W. H. SAXTON, M.D. (1946)

C. E. SHERWOOD, M.D. (1947)

G. A. STEVENS, M.D. (1948)

Huron

Madison

Sioux Falls

SPECIAL COMMITTEES

RADIO

R. E. JERNSTROM, M.D.

S. M. HOHF, M.D.

L. J. PANKOW, M.D.

Rapid City

Yankton

Sioux Falls

EDITORIAL

D. S. BAUGHMAN, M.D.

J. C. SHIRLEY, M.D.

J. C. OHLMACHER, M.D.

C. E. SHERWOOD, M.D.

GILBERT COTTAM, M.D.

WM. DUNCAN, M.D.

F. S. HOWE, M.D.

R. G. MAYER, M.D.

Madison

Huron

Vermillion

Madison

Pierre

MEDICAL LICENSURE

G. W. MILLS, M.D.

J. D. ALWAY, M.D.

F. J. ABTS, M.D.

Wall

Aberdeen

Yankton

ADVISORY WOMEN'S AUXILIARY

C. E. SHERWOOD, M.D.

J. H. HAGEN, M.D.

J. A. KITTLESON, M.D.

Madison

Miller

Sioux Falls

ALLIED GROUP

W. E. DONAHOE, M.D.

R. A. WEBER, M.D.

G. E. WHITSON, M.D.

Sioux Falls

Mitchell

Madison

MILITARY AFFAIRS

J. C. SMILEY, M.D.

I. L. SCHUCHARDT, M.D.

J. F. MALLOY, M.D.

Deadwood

Aberdeen

Yankton

RADIOLOGY

N. J. NESSA, M.D.

B. C. MURDY, M.D.

J. H. LLOYD, M.D.

Sioux Falls

Aberdeen

Mitchell

SPAFFORD MEMORIAL FUND

FOR SCHOLARSHIP AT UNIVERSITY OF SOUTH DAKOTA

J. C. OHLMACHER, M.D.

Vermillion

MEDICAL SERVICE AND PUBLIC RELATIONS	
N. J. NESSA, M.D.	Sioux Falls
T. F. RIGGS, M.D.	Pierre
G. W. MILLS, M.D.	Wall
PREPAYMENT AND INSURANCE PLANS	
H. R. BROWN, M.D.	Watertown
C. E. ROBBINS, M.D.	Pierre
R. E. JERNSTROM, M.D.	Rapid City
R. G. MAYER, M.D.	Aberdeen
C. E. SHERWOOD, M.D.	Madison
COMMITTEE FOR STUDY OF REJECTIONS OF SELECTEES IN SOUTH DAKOTA	
A. TRIOLO, M.D.	Pierre
LT. COL. R. F. SACKETT, M.D.	Rapid City
R. E. JERNSTROM, M.D.	Rapid City
COMMITTEE ON UNIVERSITY OF SOUTH DAKOTA FOUR-YEAR MEDICAL SCHOOL	
C. E. ROBBINS, M.D.	Pierre
D. S. BAUGHMAN, M.D.	Madison
F. S. HOWE, M.D.	Deadwood
Advisory to State Board of Health	
OPHTHALMOLOGY AND OTOLARYNGOLOGY	
H. D. NEWBY, M.D.	Rapid City
C. M. KERSHNER, M.D.	Brookings
O. J. MABEE, M.D.	Mitchell
ORTHOPEDICS	
G. E. VAN DEMARK, M.D.	Sioux Falls
F. W. MINTY, M.D.	Rapid City
W. H. KARLINS, M.D.	Webster
SOCIAL SECURITY	
W. A. DAWLEY, M.D.	Rapid City
A. J. SMITH, M.D.	Yankton
M. M. MORRISSEY, M.D.	Pierre
MATERNAL AND CHILD WELFARE	
E. A. PITTINGER, M.D.	Aberdeen
E. T. LIETZKE, M.D.	Beresford
L. J. LERAAN, M.D.	Sioux Falls
INDUSTRIAL HEALTH	
R. W. MULLEN, M.D.	Sioux Falls
R. J. JACKSON, M.D.	Rapid City
P. P. EWALD, M.D.	Lead
E. M. I. C.	
R. E. JERNSTROM, M.D.	Rapid City
A. P. PEEKE, M.D.	Volga
C. E. LOWE, M.D.	Mobridge

ANNUAL MEETING OF THE COUNCIL OF THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

First Session, Saturday, June 9, 1945

The meeting, held at Hotel Lincoln, Watertown, South Dakota, was called to order at 8:20 P.M. by the chairman of the council, Dr. W. E. Donahoe, Sioux Falls. On roll call the following officers and councilors were present:

President, D. S. Baughman, Madison; president-elect, Wm. Duncan, Webster; vice president, F. S. Howe, Deadwood; secretary-treasurer, R. G. Mayer, Aberdeen; delegate to the American Medical Association, N. J. Nessa, Sioux Falls.

Councilors: Second district, H. R. Brown, Watertown; third district, G. E. Whitson, Madison; fourth district, C. E. Robbins, Pierre; fifth district, W. H. Saxton, Huron; sixth district, J. R. Lloyd, Mitchell; seventh district, W. E. Donahoe, Sioux Falls; ninth district, R. E. Jernstrom, Rapid City; twelfth district, D. A. Gregory, Milbank. The following councilors were absent: First district, J. L. Calene, Aberdeen; eighth district, E. M. Stansbury, Vermillion; tenth district, R. V. Overton, Winner; eleventh district, C. E. Lowe, Mobridge.

Drs. Gilbert Cottam, A. Triolo, L. J. Pankow, J. A. Kittelson, W. G. Magee, H. T. Kenney, and our legal advisor, Mr. Karl Goldsmith, were also present.

The minutes of the December meeting were read and approved. The report of the secretary-treasurer was read and referred to the committee on auditing and appropriations. The chairman appointed Drs. H. R. Brown, C. E. Robbins and D. A. Gregory as the committee on auditing and appropriations.

The reports of the councilors for each district were received. First district. R. G. Mayer reported only one district meeting

held during the past year. Membership fair, but should be better.

Second district. H. R. Brown reported five meetings, more social than scientific, membership good.

Third district. G. E. Whitson reported his society functioning well as usual, with regular meetings being held every two or three months.

Fourth district. C. E. Robbins presented a written report, with membership good, four meetings held during the year.

Fifth district. W. H. Saxton reported two meetings during the year and eleven members paid up, but dues not forwarded to the secretary of the state association.

Sixth district. J. H. Lloyd reported only one meeting held during the year and membership not as good as it should be.

Seventh district. W. E. Donahoe reported excellent membership and regular monthly meetings held except during the summer months.

Eighth district. No report, but President D. S. Baughman reported district as very active and in good condition.

Ninth district. R. E. Jernstrom reported good membership and four regular meetings held during year.

Tenth district. No report, but President D. S. Baughman reported district as functioning well with small membership available.

Eleventh district. No report, but President D. S. Baughman reported no meetings held.

Twelfth district. D. A. Gregory reported good membership and three meetings held during year.

As delegate to the A.M.A., N. J. Nessa reported that no meeting is scheduled for 1945 unless the ODT grants permission, which so far has been refused.

Dr. A. Triolo, chairman of the committee for study of reasons for rejection of selectees in South Dakota, reported that data for study was not yet available. The secretary read a letter from the Nebraska state medical association regarding the Children's Bureau, U. S. Department of Labor, which was referred to the committee on maternal and child welfare and the E.M.I.C. committee. A letter from the South Dakota osteopathic association regarding senate Bill 62 was read by the secretary. A motion was made by C. E. Robbins, seconded by Wm. Duncan, and carried, that the letter be referred to the committee on public policy and legislation. The committee referred it to Drs. Baughman and Duncan to draw up a resolution and present it to the house of delegates.

Mr. Karl Goldsmith, legal advisor, gave an informal report on legislation, discussing SB 160, the enabling act for prepayment medical care; SB 108, Blue Cross legislation; HB 10, the bill regarding the appointment of members of county boards of health; and HB 21, the bill which permits any licensed doctor to practice in county hospitals. General discussion on these matters followed, among those taking part in the discussion being Drs. Duncan, Baughman, Robbins, Brown, Whitson, Pankow, Jernstrom and Kittleson. On motion the meeting adjourned at 11 P.M.

R. G. MAYER, M.D., Secretary.

Second Session, June 10, 1945

The second session of the council was called to order by the chairman, Dr. W. E. Donahoe, Sioux Falls, at 5 P.M. The chairman made a few remarks, stating that he had enjoyed working with the councilors for many years and that he regretted that ill health made his retirement necessary. On roll call the following were present: Baughman, Duncan, Howe, Mayer, Nessa, Brown, Robbins, Saxton, Lloyd, Donahoe, Pankow, Gregory.

The next order of business being election of a chairman, Dr. C. E. Robbins, Pierre, was nominated by D. A. Gregory. A motion that nominations be closed was made by J. H. Lloyd, seconded by F. S. Howe, and carried, and C. E. Robbins declared elected chairman.

The matter of a new councilor for the Watertown district, since Dr. H. R. Brown had been elected vice president, was referred to the Watertown district for recommendations, on motion by Gregory, seconded by Lloyd and carried. The time and place of the 1946 annual meeting was referred to the president and secretary. The meeting adjourned at 5:30 P.M.

R. G. MAYER, M.D., Secretary.

SECRETARY'S REPORT—1944-45

The report of your secretary for the past year will be very brief. The number of magazines and pamphlets, letters received and answered, ran well into the thousands. Mimeographed letters were mailed to the members on various subjects: war bond drives, state legislature candidates and members, legislative bills affecting the medical profession, basic science board finances, meetings, etc. Numerous letters, telegrams and telephone calls were exchanged with officers, councilors, district secretaries and members regarding state medical association matters.

Two medical conferences were attended, the annual conference of state secretaries and editors in Chicago in November and the North Central medical conference in St. Paul in December. South Dakota was well represented at the St. Paul conference, Drs. Baughman, Nessa, Calene, Brown, Whitson, Lloyd, Sherwood, Cottam and Triolo being present.

It was impossible to attend any district society meetings the past year. I hope that I can visit a majority of the districts the coming year.

The finances of the association are in good condition as you will see from my report as treasurer. The membership of the association is gradually decreasing. This is partly due to the fact that the number of physicians in the state is decreasing steadily, but also because the district societies do not hold enough interesting meetings to keep the interest of the membership alive, and not enough effort is put forth to enroll every eligible physician as an active member.

The following is the analysis of the active membership, showing a comparison of last year's figures at convention time, and total membership attained by the close of the year, non-members, honorary members and members in the armed services:

District	May 1944	Dec. 1944	May 1945	Non-Honorary Members	Honorary	Armed Service
1. Aberdeen	28	28	28	11	1	4
2. Watertown	18	19	18	4	0	3
3. Madison	18	19	17	2	2	1
4. Pierre	13	14	15	4	1	3
5. Huron	13	15	0	15	0	2
6. Mitchell	24	24	22	9	2	4
7. Sioux Falls	44	44	42	6	7	9
8. Yankton	24	25	27	14	2	4
9. Black Hills	40	41	39	15	26	15
10. Rosebud	5	5	4	1	0	1
11. Northwest	10	8	7	0	0	3
12. Whetstone Valley	13	13	12	4	0	1
Totals	250	255	231	85	41	50

R. G. MAYER, M.D., Secretary.

TREASURER'S REPORT—1944-45

Balance on hand May 18, 1944 \$3,715.90

Receipts:

Net convention receipts, 1944	\$ 55.31
1944 dues, 7 members	105.00
1945 dues, 231 members	3,465.00

Total \$3,625.31

Total \$7,341.21

Disbursements:

1944 convention expenses	\$ 346.56
JOURNAL-LANCET subscriptions, 252	504.00
Legislative fund	500.00
Benevolent fund	125.00
North Central conference (2 years)	100.00
A.M.A. delegate expenses, 1944	74.00
Refund—Dues Northwest district	30.00
Council and officers expenses	241.71
Karl Goldsmith, retainer (13 months)	325.00
Karl Goldsmith, legislative expenses	350.39
Secretary's salary (13 months)	650.00
Secretary's traveling expenses	173.32

Secretary's Office Expenses:

Bank charges	\$ 4.49
Social security tax	6.00
Bond	10.00
Stenographic expense	119.09
Stationery, cards, etc.	119.10
Postage	6.62
Telegrams	10.37
Telephone calls	13.13
Total	288.80
Total	\$3,708.78
Balance on hand June 7, 1945	3,632.43
(Checking Account, First National Bank, Aberdeen, So. Dak.)	Total \$7,341.21
LEGISLATIVE FUND	
Balance on hand May 18, 1944	\$ 283.68
Deposit from checking account	500.00
Interest	6.60
Total	\$ 790.28
Savings Account, First National Bank, Aberdeen, So. Dak.)	R. G. MAYER, M.D., Secretary-Treasurer.

PROCEEDINGS OF THE 64TH ANNUAL MEETING OF THE HOUSE OF DELEGATES

South Dakota State Medical Association

Morning Session, June 10, 1945

The morning session of the house of delegates was called to order by the president, Dr. D. S. Baughman, Madison, at 10:00 A.M., June 10, 1945, at the Hotel Lincoln, Watertown, S. D. The roll call was read by the secretary and the following members were present:

Drs. D. S. Baughman, Madison; Wm. Duncan, Webster; F. S. Howe, Deadwood; R. G. Mayer, Aberdeen; N. J. Nessa, Sioux Falls; H. R. Brown, Watertown; C. E. Robbins, Pierre; William Saxton, Huron; J. H. Lloyd, Mitchell; W. E. Donahoe, Sioux Falls; R. E. Jernstrom, Rapid City; D. A. Gregory, Milbank; E. A. Rudolph, Aberdeen; H. T. Kenney, Watertown; E. S. Watson, Brookings; M. M. Morrissey, Pierre; L. J. Pankow, Sioux Falls; C. J. McDonald, Sioux Falls; J. A. Kittleson, Sioux Falls; A. P. Reding, Marion; G. W. Mills, Wall; D. L. Kegaries, Rapid City; W. L. Meyer, Sanator; O. S. Randall, Watertown; W. G. Magee, Watertown.

A motion was made by L. J. Pankow, seconded by D. A. Gregory, and carried, that since the minutes of the previous session were published in the JOURNAL-LANCET, their reading be dispensed with. The president appointed the following reference committees: committee on reports of officers—Kenney, McDonald, Reding; committee on resolutions and memorials—Nessa, Robbins, Watson; committee on amendments to constitution and by-laws—Saxton, Donahoe, Meyer; committee on nominations—Gregory, Kittleson, Randall; committee on credentials—Mills, Pankow, Rudolph.

The reports of the officers were next heard. The president, Dr. D. S. Baughman, reported that he had visited all but two of the twelve district societies during the year. He said that the strength of the state association lies in the district societies and hoped that they would all work better during the coming year. He also reported that he had attended the annual meeting of the American Medical Association, and the North Central conference in St. Paul (where South Dakota was well represented, there being ten physicians from the state in attendance). The president-elect, Dr. William Duncan, Webster, said that he would try to build up the legislative program during the year, that because of the shortage of physicians in South Dakota all of them were suffering from chronic fatigue, but they should remember that the important thing was what each one did for the society—not what the society did for them. Vice President F. S. Howe, Deadwood, said that from the reports of the component societies all of them were not functioning as they should, socialized medicine was the big problem, the people are sold on prepayment plans and if we do not do it the government will. Regarding the legislative program, he said that it was very important to contact the legislators at home. The

secretary-treasurer read his report and the minutes of the council meeting. The reports were referred to the committee on reports of officers.

The reports of the standing committees were then heard. The committee on scientific work reported that since no scientific session was planned for the 1945 meeting the committee had nothing to report. For the committee on public policy and legislation oral reports were made by Drs. Baughman and Duncan and Mr. Karl Goldsmith and a letter summarizing the action of the legislature on bills affecting the medical profession was presented. Dr. Duncan mentioned a letter received from the South Dakota osteopathic association regarding senate Bill 62, referring to the licensing of hospitals. Mr. Goldsmith also referred to a resolution passed by the state pharmacists association requesting membership on the state board of health. He said that this would lead to the licensing of pharmacists by the state board of health, which the pharmacists would not want and he suggested that the members of the medical profession talk to their pharmacists regarding the matter.

An oral report by the chairman of the committee on publications stated that the contract with the JOURNAL-LANCET still had three years to run, more news items, editorials and scientific articles were needed from South Dakota. Mr. M. Wolff, of the JOURNAL-LANCET, Minneapolis, Minn., was called upon for remarks and he suggested that component societies have more scientific sessions and have papers published in the JOURNAL-LANCET. Of 130 contributions only six were from South Dakota, outside of papers read at the state convention, and three of these were from the Black Hills district. North Dakota had fourteen, Montana five, and Minnesota sixty-one. He also stated that the JOURNAL-LANCET would be glad to send complimentary copies to non-members in South Dakota occasionally in order to interest them in the state medical association, and that the publishers would always welcome suggestions for improvements.

A letter from the chairman of the committee on medical defense, Dr. T. F. Riggs, Pierre, was read. The subject was discussed by Dr. L. J. Pankow, Sioux Falls, and a motion was made, seconded and carried that the file on this subject be referred to the new committee on medical defense. The reports of the committee on medical education and hospitals and the committee on medical economics were read, and all of these reports of committees were referred to the committee on resolutions and memorials.

Dr. A. Triolo, chairman of the committee on public health, had the chairmen of the various sub-committees present their reports. Dr. O. S. Randall, chairman of the sub-committee on cancer, presented a written report, as did Dr. W. L. Meyer, for the sub-committee on tuberculosis. The sub-committee on mental hygiene and child welfare had no report. On motion the meeting adjourned at 12:15 P.M. until 2:00 P.M., for dinner at the Watertown country as guests of the Watertown district medical society.

Afternoon Session

The meeting was called to order at 2:15 P.M. by the president, Dr. D. S. Baughman. On roll call the following were present: Drs. Baughman, Duncan, Howe, Mayer, Nessa, Brown, Robbins, Saxton, Lloyd, Donahoe, Gregory, Rudolph, Kenney, Watson, Morrissey, C. S. Bobb, Pankow, Kittelson, Reding, Mills, Kegaries.

The report of the sub-committee on syphilis control program was read by Dr. Gilbert Cottam, Pierre. The report of the committee on necrology, Dr. E. Joyce, Hurley, chairman, was read, as was the report of Dr. W. E. Donahoe, chairman of the committee on medical benevolence.

The written reports of the following special committees were then read: Radio broadcast, editorial, medical licensure, radiology, medical service and public relations, prepayment and insurance plans, maternal and child welfare, and E.M.I.C., and referred to the committee on resolutions and memorials. Dr. Wm. Duncan gave an oral report for the committee on military affairs, stating that the list of South Dakota physicians in the armed services would be published in the JOURNAL-LANCET, two having been added since the last annual session. No reports were received from the committees on advisory women's

auxiliary, allied group, ophthalmology and otolaryngology, orthopedics, social security, and industrial health.

The committee on credentials reported that 25 members were present at the morning session, every district being represented except the tenth and eleventh. The committee on nominations reported the following nominations: President-elect—F. S. Howe, Deadwood, D. S. Baughman, Madison; vice president—H. R. Brown, Watertown, N. J. Nessa, Sioux Falls; councilors: third district—G. E. Whitson, Madison; fifth district—Wm. Saxton, Huron; sixth district—J. H. Lloyd, Mitchell; seventh district—L. J. Pankow, Sioux Falls; and recommended that the time and place of the 1946 convention be left to the officers. Drs. D. S. Baughman and N. J. Nessa withdrew their nominations. Since there were no contests, a motion was made by D. A. Gregory, seconded by William Saxton, and carried, that the rules be suspended and the nominees be elected by acclamation.

Dr. William Saxton, chairman of the committee on amendments to the constitution and by-laws, reported that his committee had no report except a suggestion that at the next annual session an amendment to the by-laws be submitted so that the house of delegates may name a substitute for any officer or councilor who is absent. Dr. H. T. Kenney, chairman of the committee on reports of officers, reported that his committee approved of the reports of the officers as given, and moved the adoption of the report, which was seconded and carried.

Dr. N. J. Nessa, chairman of the committee on resolutions and memorials, presented the report of his committee, recommending the approval of the reports of all of the committees referred to it with the following additional recommendations: regarding the report of the committee on medical education and hospitals it recommends further study of the facts regarding the four-year medical school plans by a special committee to be appointed by the president and report to the council at its next meeting. A motion to this effect was made by Nessa, seconded by Robbins and carried.

A report of a special committee on child welfare and E.M.I.C., consisting of Drs. Donahoe, Jernstrom and Duncan, was as follows: "The Journal of the American Medical Association, March 3, 1945, carried an article regarding 'Recommendations adopted by the Steering Committee on Health Services Advisory to the Children's Bureau, U. S. Department of Labor, Washington, D. C., January 28th.' This proposes to give the children's bureau almost unlimited powers. It puts the bureau into the field of public health where it in no wise belongs. It places a large section of the practice of medicine under the domination of a lay-controlled bureau." It is resolved by the South Dakota state medical association that all such medical programs follow medical collaboration and direction, rather than lay groups and people, an increase in federal appropriations to the children's bureau at this time is opposed, and it is resolved that the secretary be instructed to forward copies of this resolution to the South Dakota state board of health, the children's bureau in Washington, D. C., its advisory medical committee, and the South Dakota representatives and senators in Congress. A motion to adopt the above resolution was made by W. E. Donahoe, seconded by J. H. Lloyd and carried.

A motion that a resolution of thanks to the Watertown district medical society for their kind hospitality be presented was seconded and carried. The committee on auditing and appropriations presented its report. A motion was made by H. R. Brown, seconded by J. A. Kittleson, and carried, that the report be adopted and the estimated budget for 1945-46 be approved.

Under new business there was discussion of matters relating to examinations conducted by the state board of medical examiners and the basic science board of examiners, and an amendment to the basic science act was suggested to provide for an annual registration fee to raise funds for its administration. A motion was made by L. J. Pankow, seconded by J. A. Kittleson, and carried, that the matter be referred to the committee on public policy and legislation. A motion to adjourn was made by N. J. Nessa, seconded by William Duncan, and carried at 4:45 P.M.

R. G. MAYER, M.D., Secretary.

Committee on Auditing and Appropriations

Vouchers, checks, bank books, remittances from various district societies, disbursements and all records were examined and found in order and the books balanced.

Estimated Budget, 1945-46

Estimated Income	\$3,900
Estimated Disbursements:	
Retainer, attorney	\$300.00
Secretary's salary	600.00
JOURNAL-LANCET	550.00
Secretary's office expenses	300.00
Secretary's traveling expenses	150.00
Council meeting expenses	250.00
Benevolent fund	125.00
Legislative fund	500.00
North Central conference	50.00
Miscellaneous	325.00
Total	3,150.00
Estimated Balance	\$ 750.00

H. R. BROWN, M.D.
D. A. GREGORY, M.D.
C. E. ROBBINS, M.D.

REPORTS OF STANDING COMMITTEES

Committee on Public Policy and Legislation

Oral reports to house of delegates by Drs. Baughman and Duncan and Mr. Karl Goldsmith. (Letter from Goldsmith).

"The legislature will adjourn this afternoon, and the following is a brief report on its action so far as it affects your association or the members thereof:

Senate Bill 62, which provides that the state board of health shall license hospitals and have control thereof so far as sanitary and other like measures are concerned, has passed both houses.

Senate Bill 108—Blue Cross—has passed both houses although considerably amended. I believe it is still workable and if there is anything which hampers such an organization, it can be corrected at the next session of the legislature.

House Bill 10, which provided that the boards of county commissioners should appoint the county superintendents of health, died in committee.

House Bill 21, which, as amended, provides that the trustees of a county hospital shall not discriminate between licensed doctors, passed both houses and has been signed by the governor.

Senate Bill 160, the prepayment medical plan, passed the senate and died in the house committee on public health of which Dr. Mills is chairman. Dr. Mills was unalterably opposed to this measure, and while the bill could have probably been pried out of the committee, there was so much opposition, particularly that of Dr. Mills, that it was thought best to leave the bill where it was."

Sincerely yours,
KARL GOLDSMITH.

RESOLUTION

Concerning referendum on hospital licensing act
known as Senate Bill 62

Whereas at the last session of the South Dakota state legislature there was passed a certain hospital licensing act known as senate Bill 62, and

Whereas the South Dakota state medical association believes that said act is for the general good of the people of the state of South Dakota, and

Whereas there have now been legally filed petitions to refer said senate Bill 62 to the people of South Dakota at the next general election.

Now therefore be it resolved that the South Dakota state medical association go on record as being opposed to the referendum on said senate Bill 62 and in favor of having this bill become law as originally passed by the 1945 legislature.

D. S. BAUGHMAN, M.D., Chairman.
W.M. DUNCAN, M.D.

Committee on Medical Defense

I wish to submit the following report of the medical defense committee, namely, that the report tabled five or six years ago be given reconsideration.

Respectfully yours,

T. F. RIGGS, M.D., Chairman.
G. W. MILLS, M.D.
C. J. McDONALD, M.D.

Committee on Medical Education and Hospitals

I wish to submit the following report of the committee on medical education and hospitals:

It is the opinion of the members of the committee that the idea of the new four year school at Vermillion should be strongly supported. The preceptor plan can be carried out even farther than originally proposed, especially if the 9-9 months present medical education plan be eliminated and returned to the old four-year course. Many of these medical students can work in hospitals throughout the state during the interval between their first and second, second and third, and third and fourth years, gaining considerable experience which is valuable during their final year.

We suggest that Dr. J. C. Ohlmacher and President Weeks formulate a plan in writing in regard to a curriculum.

Respectfully yours,

T. F. RIGGS, M.D., Chairman.
E. M. STANSBURY, M.D.
GEOFFREY COTTAM, M.D.

Committee on Medical Economics

As the committee on medical economics, we feel that the members of this society have two major problems to consider this year, one on the national level, the other on our own state level.

On the national level, the Wagner-Murray-Dingell Bill (S. 1050 of 1945) is the culmination of forces, both in and out of the government, which have gradually grown in strength during the last decade. As you know, it provides a system of compulsory sickness insurance, grants and loans for the construction of health facilities, grants to states for public health services, also a comprehensive public assistance program, and a national system of public employment offices.

This bill would place tremendous authority in the hands of the surgeon general, and would revolutionize medical care in the United States. Among its main proponents are the American Federation of Labor and the CIO, both tremendously powerful organizations. Unless ways and means can be devised to stop it, we physicians may very well find ourselves carrying a union card and taking orders directly from Philip Murray or John L. Lewis. There is grave need for thought and concerted action on the part of our profession if medical chaos is to be averted.

On the state level, we were confronted at the last state legislature with a strong cultist lobby that had money to spend and that knew how to use it. Our bill to establish an enabling act never got out of committee. The bill to permit osteopaths and chiropractors to practice in county hospitals passed in spite of our best efforts. At present there is a referendum pending by the chiropractors association to take the licensing of hospitals out from under the supervision of the state board of health.

We physicians have very little time and very few of us much political influence to give to the protection of the interests of our profession. We do have a good sized membership, most of whom make a very sizable income. Is it not reasonable that we should at least use our financial resources to protect our own interests?

Our committee recommends that an ample legislative fund be raised, either by increasing our annual dues or by special assessment, to take care of our interests at future sessions of the legislature. It seems to us that we have been pushed around long enough.

C. E. ROBBINS, M.D., Chairman.
D. A. GREGORY, M.D.
W. A. DAWLEY, M.D.

Committee on Public Health

A. TRIOLO, M.D., General Chairman

Sub-committee on Cancer:

Although this committee has not functioned as a unit, each of the members, namely: Dr. R. E. Jernstrom, Dr. Gilbert Cottam and myself, have worked individually to the best of our ability in the field during the past year and I include reports from the other members of this group. Dr. Jernstrom, in a recent letter to me, stated that he would like to recommend that steps be taken for the establishment of tumor clinics as soon as conditions warranted. Dr. Jernstrom stated that one was to be established at Rapid City as soon as a pathologist could be obtained. He further stated that he felt cancer was closely related to public health and that some help might be obtained from the state board of health in organizing these clinics.

As superintendent of the state board of health, Dr. Cottam sends me the following report:

"During the past year the activities of the state board of health in cancer control have been limited to educational efforts and the provision of a small fund of money from the United States public health service for the examinations of sections by a pathologist in certain selected cases. Our publicity has been carried on through special issues of our monthly bulletin, 'South Dakota Public Health Highlights,' which goes to approximately 2,400 individuals and organizations, with special articles on cancer control at varying intervals during the year, and answering numerous letters of inquiry in regard to cancer. When funds are available the state board of health will be glad to encourage and cooperate with the medical profession in the establishment of a cancer center for the diagnosis and treatment of cancer patients, but such an institution, to be effective, would require the expenditure of a considerable amount of money to build, equip and maintain, together with the securing of suitable competent personnel and such a program would be impracticable during war times unless extensive private funds were donated for the purpose.

It is entirely possible that with the authorization of a four-year medical school such a cancer center, reasonably soon, might be set up as part of the teaching program and thus be capable of maintenance at a high professional level without encroaching on the domain of the private practitioner and also be handled more economically than if it existed as an entirely separate project."

* * *

Through efforts of our president, Dr. Baughman, and Mrs. Peterson, district commander of the American Cancer Society, of Billings, Mont., and Dr. Larson, Bismarck, No. Dak., we have begun the organization of the state of South Dakota in the campaign for the American Cancer Society. Mrs. Harry T. Dory of Watertown has been appointed the South Dakota commander and I give her report as follows:

"I wish to outline the progress made by the South Dakota division of the American Cancer Society since I was appointed state commander in February of this year.

Approximately 50,000 pieces of literature have been distributed from my desk, giving the state fair coverage. A member from each of two hundred and fifty different organizations has been appointed to work with the society in the distribution of material to their individual organizations.

Three counties, Lawrence, Fall River and Meade, have been organized with county commanders and captains appointed in the various towns and counties.

In 1945 the campaign for funds is just now drawing to a close, and while the returns are not complete we have received around \$3,600.

For next year's work, I plan the organization of as many counties as possible; the continuation of the educational program to the laity; the institution of the school program wherever practical and possible; and the campaign for funds for the work of 1946-47."

* * *

This work was done in the last six months and I feel that a great deal of ground work has been accomplished and the outlook for the organization appears to be quite bright. During the next year it is proposed that each county or district in this

state be organized and an educational program instituted. The recent campaign in this state for funds for the society was led by A. H. Sexauer of Brookings and although our goal was not met, it is felt by those of us who have aided in this effort that by and large it was quite successful. Mr. Eric Johnson will be campaign manager of the United States for the next year and it is our desire that Mr. Sexauer continue in his position also. Admiral Charles S. Stevenson, retired, U. S. Navy, was appointed by the national executive committee of the American Cancer Society to succeed Dr. C. C. Little as managing director.

To adequately care for this unfortunate group of patients we need the full cooperation of each physician in this state, the state board of health and the American Cancer Society.

O. S. RANDALL, M.D., Chairman.

R. E. JERNSTROM, M.D.

GILBERT COTTAM, M.D.

Sub-Committee on Tuberculosis:

1. First we feel that an early diagnosis campaign is most important in the control of tuberculosis. Only by the early detection of tuberculosis, with the isolation of active cases, can the spread of the disease be prevented. It is much more important to detect cases when they are in the incipient stages and when they have a reasonable chance of cure without serious later impairment of respiratory function, than it is to use extensive means to control the far advanced case.

(a) There are several methods that are of much value in the detection of the early cases. First the examination of every contact of an active case must be religiously carried out. If a thorough enough search is performed throughout the associates and immediate family of the active case it is very probable that other active cases will be detected that have been infected from the original source or from the present patient. A half-hearted search for such sources of infection will be of little value and will only give the relatives a false sense of security. It is our responsibility, as physicians, to follow up this as a duty to the community in which we live.

(b) Mass survey will be started within the near future. Soon a portable truck unit will be ordered and it will probably be in operation by the last of the year. Other such units should be purchased at later dates, depending on the proportion of the population of the state that it is possible to examine with this one unit. It is the plan, at the present time, that this unit be operated out of the state board of health and that an x-ray technician, a clerk and two nurses accompany this unit. It will visit various towns, plating as many as possible in that town, on 70 mm. film. These films will be returned to the sanatorium for examination. Any suspicious film will be reported to the family physician for follow-up studies, including 14x17 film and clinical examination. The family physician's name and address will be secured for each patient and the report will go only to him. No report will go to the patient. At this time it is planned that the operation of this unit will be by funds supplied to the state board of health from the federal government. Money that is used for the maintenance of the sanatorium may be used for matching purposes.

2. There are a number of patients with active tuberculosis that refuse to observe any type of isolation, either in the home or in the sanatorium. In a number of instances patients with active tuberculosis have remained at home or have returned home against advice, to live with their families. In at least two instances several children in the home have acquired active tuberculosis and, in one of these instances two of the children were in the sanatorium. We feel that it is regrettable that innocent members of society have not a right to demand that they be protected from individuals who have no social responsibility. When the war is over it is planned to rebuild one of the units at the sanatorium so that it will be fire-proof. Several rooms should be constructed as detention rooms where uncooperative patients may be detained if they are a menace to society and refuse to remain under voluntary quarantine; either in the home or in a sanatorium approved by the board of health. At the present time the attorney general feels that patients may be quarantined at the sanatorium, but it is impossible to enforce such quarantine without a room where they may be locked up. A fire-proof room would be necessary for such a procedure. We wish to go on record as favoring the passage of legislation so that it would be possible for the county authori-

ties to transport patients to the sanatorium and enforce their remaining here under quarantine. In only a few instances would this be necessary, but such a procedure should be set up so that it may be used in an emergency for uncooperative cases.

3. When the present emergency makes help more available, it is planned to ask for an increase in the assistance from the federal government so that the services of a tuberculosis consultant may be secured. This consultant will be under the direction of the sanatorium. He will work out of that institution. It will be his purpose to hold clinics in various parts of the state, preferably in a hospital. Any licensed physician may bring patients for consultation. It is particularly desirable that ex-patients of the sanatorium visit this clinic for check-ups.

W. E. MORSE, M.D., *Chairman*.
W. L. MEYER, M.D.

Sub-Committee on Mental Hygiene and Child Welfare
(No report)

Sub-Committee on Syphilis Control Program,
U.S.P.H. Service:

The principal changes I have to report since the last meeting are that we have discontinued issuing drugs for the treatment of any form of tertiary syphilis, believing that, being non-communicable, the treatment of syphilis in this stage is wholly within the province of the private practitioner. We issue penicillin to treatment centers within the state only for early dark field proven cases of syphilis or if the preliminary sore is healed in early secondary and early latent cases, since the consensus of experience thus far does not seem to warrant the use of penicillin in later stages. We issue arsenicals and heavy metals solely for the treatment of syphilis up to the end of the secondary stage but not for tertiary syphilis. The incidence of syphilis in South Dakota, according to our records, is very low.

GILBERT COTTAM, M.D., *Chairman*
ANTON HYDEN, M.D.

Committee on Necrology

"Because I live, ye shall live also." These words spoken by the Great Physician nearly two thousand years ago, bring a comforting thought to members of the medical profession as we assemble here today. Many familiar faces whose presence meant so much to us in the past will be greatly missed at this time and in the future. As we reflect upon the memory of those who gave from the richness of life, a full measure of devoted service to the promotion of the high principles of the practice of medicine, let us strive with faithfulness to carry on their good work. During the past year the following physicians have answered the final summons:

HUGO NEUKAMP, Hosmer, age 68. A graduate of the University of Bonn, Germany, 1898. Killed in automobile accident, June 1, 1944.

JULIAN D. MUELLER, Flandreau, age 39. A graduate of Creighton university, Omaha, Nebr., 1931. A member of the staff of the Flandreau municipal hospital and coroner of Moody county. Died of injuries received when crushed by a truck.

JAMES B. VAUGHAN, Castlewood, age 75. A graduate of Washington university, St. Louis, Mo., 1894. Located in Castlewood in 1895 where he remained until the time of his death, July 16, 1944. Dr. Vaughan was a past president of the South Dakota state medical association, and at the time of his death was a member of the state board of health. A past president of the South Dakota health officers association, Dr. Vaughan was active in state and national health affairs. He is reported to have served as county health officer for a longer period of years than any physician in South Dakota. Aside from his activities in medical affairs he was deeply interested in civic and fraternal activities, having served as grand patron of the order of Eastern Star, and at the time of his death was president of the Community State bank of Castlewood.

GEORGE SHELDON ADAMS, Yankton, age 67. Graduate of Rush medical college, 1901. In 1936 the University of South Dakota conferred upon him the degree of LL.D. Shortly after graduating from medical college he joined the staff of the Yankton state hospital as assistant physician. In March, 1904, he was appointed assistant superintendent and in 1920 became superintendent, which position he held until the time of his death, July, 1944. Thus during a period of over 43

years he devoted himself to the public service of suffering humanity, forsaking a more remunerative private practice. It was his lot to treat those less fortunate than others and to restore to the human body its most precious gift, the mind. In this field of endeavor his work was highly recognized. During his term as superintendent of the Yankton state hospital, he exerted every effort to keep abreast of the latest methods of treatment of the insane, adopting each new method as it was approved. To carry out these later methods of therapy, he sent members of the staff to training centers to become better fitted to administer the treatments. In his passing, South Dakota has lost a great physician and psychiatrist whose work has been outstanding in maintaining the high standards of the Yankton institution. Dr. Adams was past president of the South Dakota state medical association, past president of the Yankton district medical society, a member of the Sioux Valley medical society and a fellow in the American medical association. He was also a fellow and life member of the American psychiatric association and a member of the South Dakota commission for the control of feeble-minded. Dr. Adams passed away July 28, 1944, at Yankton, South Dakota.

HORACE W. SHERWOOD, Doland, age 78. A graduate of Ann Arbor, Michigan, 1896, Dr. Sherwood came to South Dakota in 1902 and located at Doland, where he continued his practice until a few years ago. A member of the South Dakota state medical association and a fellow in the American medical association, Dr. Sherwood took an active part in medical matters, having served his district as councilor for many years. He was also active in civic, church and fraternal organizations, having served as president of the school board and Sunday school superintendent for a number of years. He had the proud distinction of having two of his sons follow in his profession, namely Dr. C. E. Sherwood and Dr. J. Vincent Sherwood. Dr. Sherwood died at the home of his son, Dr. C. E. Sherwood, in Madison, August 15, 1944.

SAMUEL WALLIS, Armour, age 75. A graduate of Boston college of physicians and surgeons, 1900. Dr. Wallis came to South Dakota in 1900 and located at Miller, where he practiced for eighteen years, later moving to Armour, where he died August 30, 1944.

B. F. MARKIN, Columbia, age 65. Graduate of Columbian medical college, Kansas City, Mo., in 1900. Dr. Markin came to South Dakota in 1901 and located at Columbia, where he practiced until his death, October 7, 1944.

FRANK V. WILLHITE, Redfield, age 66. Graduate of the University of Illinois in 1905. Dr. Willhite came to South Dakota in 1909. He served as a member of the medical staff at the Yankton state hospital from 1909 until 1920 and became assistant superintendent from 1920 to 1923. He was appointed superintendent of the school for the feeble-minded at Redfield in 1923, which position he held until June, 1944 when, due to failing health, he was obliged to resign. Dr. Willhite was nationally known in social work and his constructive program, adopted at Redfield, will prove to be of value to his successors in the years to come. Dr. Willhite died at his home in Redfield October 20, 1944.

WILLIAM P. ROBERTS, Sioux Falls, age 75. A graduate of the University of Illinois, 1894, Dr. Roberts came to South Dakota in 1906 and practiced in Sioux Falls until 1942. He died January 12, 1944, following a long illness.

WILLIAM E. DICKENSON, Canistota, age 67. Graduate of the University of Illinois in 1904. Dr. Dickinson came to Canistota the same year where he continued his practice until the time of his death, except for five years spent on the staff of the Nebraska state hospital and the Colorado state hospital and also time spent in postgraduate work. Dr. Dickinson was a veteran of the Spanish-American war. He died January 28, 1945.

EARL M. YOUNG, Mitchell, age 58. Graduate of Rush Medical college, 1913. Practiced at Plankinton, S. D., from 1914 to 1918. Dr. Young came to Mitchell in 1918 where he continued to practice until the time of his death, March 21, 1945. He was a member of the Mitchell district medical society and the American Medical Association. He was on the staff of both St. Joseph's hospital and the Methodist hospital and was also city health officer of Mitchell for many years.

D. W. CRAIG, Sioux Falls, age 75. Graduate of Northwestern medical college, Chicago, 1896. Practiced four years in Chicago. Dr. Craig came to Sioux Falls in 1904, where he continued to practice until recent years. Active in civic affairs and fraternal organizations, he was an honorary member of the Seventh District medical society, A.M.A., and a veteran of World War I. Dr. Craig died May 28, 1945.

WM. GUILLAUME, Aberdeen, age 71. He was born July 10, 1873, and died May 4, 1945. Dr. Guillaume practiced in Stratford, S. D., until 1943.

E. JOYCE, M.D., *Chairman.*

J. A. HOHF, M.D.

MAGNI DAVIDSON, M.D.

Committee on Medical Benevolence

We believe in brevity in committee reports, relating only to accomplishments and aims. Little is required of this committee but the nature of this fund is most important to the society and, we think, should be reiterated every two or three years.

Following several years of investigation and work by the medical auxiliary, they saw the need of a fund from which needy physicians and their families might be helped, raised a small amount of money and in 1940 interested the state medical association in taking it over jointly.

Drs. Baughman, W. E. Donahoe and Shirley were appointed with auxiliary members, Mesdames Westaby, Nessa and Hart, to formulate plans for the conduct of the fund. By-laws were formulated and we call attention to paragraph B-1:

The State Medical benevolent committee shall elect its own chairman, secretary and treasurer. This committee shall have in its charge all relief funds of both organizations, legacies, donations and in whatsoever way they may desire and also be responsible for its complete administration, (keeping, investing, expending). It shall be incumbent upon this committee to formulate a set of rules governing and quartering the permanency, safety and confidential aspects of the conduct of this committee and fund. Further, this committee shall make a complete report annually to the executive board of the South Dakota state medical association and the women's auxiliary to the South Dakota state medical association.

Another important ruling is that no benefits be paid until the fund has reached at least \$5,000. This fund shall be administered jointly by the secretaries and three members of the association and the auxiliary, appointed by their respective presidents for three (3) year terms.

To date: Invested in series F bonds \$1,239.50

To mature in 1955 at \$1,675.

Cash on deposit in Madison Security Nat. Bk. 226.87

Aside from fifty cents per member yearly from the state medical association, small sums have been given by Madison, Pierre and Watertown auxiliaries, and \$20.00 as Dr. and Mrs. H. W. Sherwood memorial.

This committee feels this fund is important and recommends and urges the auxiliary and medical association to keep it active and enlarge it as much as possible.

W. E. DONAHOE, M.D., *Chairman.*

W. H. SAXTON, M.D.

C. E. SHERWOOD, M.D.

SPECIAL COMMITTEES

Radio Broadcasts

Radio broadcasts, which were discontinued two years ago on account of lack of material, have been resumed. Material is now obtainable in the way of transcripts from the A.M.A. It should be remembered by the state association and the district societies that radio time is so allotted and can be used at any time for special medical broadcasts, such as cancer and tuberculosis campaigns, etc. In Rapid City the broadcasts have been made weekly since February. In Sioux Falls, due to a misunderstanding, they have not as yet been started but shall be in the very near future.

Dr. Jernstrom, the committee member in Rapid City, reports a coolness on the part of the station because it is a good-will or non-profit broadcast. It will be recalled that it was for this reason that the broadcast was withdrawn from WNAX where the program, under Dr. Hohf, was first instituted.

In Sioux Falls, just the opposite is true and, as previously reported, Station Manager Henkens has always shown a great willingness to have the program and has at all times been most cooperative about the time, material, etc. It seems strange that the other stations give their reasons as the chain hook-up, but here KELO is an affiliate of the NBC who urge and regard their medical broadcasts as the best of their good-will programs. It is most likely the attitude of the local management of any station, and of course we shall have no monies for such and it would behoove us to get along the best we can. The medical broadcasts are most worthwhile and will continue to be, so your committee recommends their continuance.

While your committee members give verbal and written letters to the stations, we ask that letters of appreciation and thanks be sent from the state association by the secretary and that they be a bit expressive and flowery; you know, in lieu of money.

W. E. DONAHOE, M.D., *Chairman.*

S. M. HOHF, M.D.

R. E. JERNSTROM, M.D.

Editorial Committee

The editorial committee has no essential report to make. The JOURNAL-LANCET continues as our official publication and, as far as I know, publishes all of our scientific program papers which are submitted to it. All members of this committee were contacted for any information or recommendation to submit in this report, but no criticism or advice was received.

N. J. NESSA, M.D., *Chairman.*

J. C. SHIRLEY, M.D.

J. C. OHLMACHER, M.D.

C. E. SHERWOOD, M.D.

GILBERT COTTAM, M.D.

D. S. BAUGHMAN, M.D.

W. M. DUNCAN, M.D.

R. G. MAYER, M.D.

Committee on Medical Licensure

Medical licensure is the legal device used by the state to regulate the sale of medical service to the public. Theoretically and idealistically, this is done to insure that only a high quality of medical service may be sold. This is done by determining that the ability, character and integrity of the individual conform to certain standards before he is permitted to sell medical service.

A perversion of this idea would have special legislation passed providing for the sale of medical service by an artificial person, or corporation, that has neither ability, character nor integrity.

A physician may move into a community that under average conditions would require only about enough medical service to support one man. By doing this he keeps out any other physician and in a sense creates a monopoly for himself in the community. This in turn places a moral responsibility, at least, on him to take care of any and all of the medical needs of that community.

While on the other hand, if a corporation is permitted to sell medical service and collect in advance, they may go into such a community and sell limited services, as major surgery and obstetrics, at reduced prices and assume no responsibility for the other medical services that must necessarily be rendered by someone else. This leaves the possible income for any physician who might consider locating in that community so small that no physician will undertake to live there. Hence, what may look to be an advantage to the community, in having lower charges for some limited services, proves to be a disadvantage, by robbing them of any chance to have someone who will take care of the rest of the needs, including often emergencies that mean loss of life if not taken care of.

Another disadvantage to the small community is that the patient does not have a physician at hand to render the service but must go to the place where the service is provided by the corporation. This will tend to concentrate the work and the physicians in the larger centers.

South Dakota is primarily a state of rural communities, which consist of small towns and surrounding farms. Anything that robs these communities of their medical service or takes it farther away from them is detrimental to the public welfare.

A glance at a map prepared by our state health department, showing the location of the physicians in the state, reveals that

about 40 per cent of the physicians of the state are found in the eight largest cities, which cities contain only about 20 per cent of the state's population. Or putting it another way, in the eight largest cities of the state there is one doctor for 804 people, while in the remainder of the state there is one doctor to 2,542 people. Thus, we see that in South Dakota, we have not only a shortage of doctors but we have a very poor distribution of doctors.

Analyzing this distribution further as to age groups, we find that only 33 per cent of the doctors in the eight largest cities are over 65 years of age, while 40 per cent of the doctors outside the largest cities are over 65 years of age. Thus, we see that the burden of caring for the larger per capita load is falling on the group that is less physically fit to carry it.

This tends to force more and more of the people of the rural areas to go to the cities for care of the major illnesses.

It is with the hope that this trend could be stopped and a supply of physicians provided who might be induced to locate in the smaller towns, that the legislature provided for expansion of our medical school to a four year course. Another factor that will influence doctors to return to the smaller towns is the providing of small hospitals, properly equipped, in those towns.

A realization of this fact is shown by the number of small hospitals now publicly owned and by the number of county hospitals being proposed in the state.

Any legislation that will tend to hinder the development of more of such hospitals or might make it more difficult for doctors to return to the smaller communities will be carefully considered before passage by the legislature, I am sure.

We recommend thorough discussion by the society as a whole, any changes to be proposed in our methods of selling medical services to the end that any method adopted will best serve our state as a whole.

G. W. MILLS, M.D., *Chairman.*
F. H. COOLEY, M.D.
F. G. ABTS, M.D.

Advisory Women's Auxiliary

No report.

Allied Group

No report.

Committee on Military Affairs

The military affairs committee reports the addition of three more physicians to the list of those now serving in the armed forces. They are as follows: J. E. Studenberg, Gregory; R. A. Buchanan, Huron, and F. J. Gilbert, Belle Fourche.

During the past year, two physicians have been released from the armed forces and returned to practice in South Dakota: J. F. Malloy of Yankton and W. T. Ferris of Chamberlain. The latter, however, was forced to discontinue practice again because of ill health.

According to information received from the procurement and assignment service there may be a few more physicians released during the coming year and first consideration for release will probably be given to general practitioners who intend to return to their former locations provided that it can be shown that they are greatly needed there.

W. M. DUNCAN, M.D., *Chairman.*
H. T. KENNEY, M.D.
D. A. GREGORY, M.D.

Committee on Radiology

The radiological committee has nothing to offer—only to sympathize with the shortage in the film situation which has developed. Commercial x-ray, lend lease and military demands have reduced the 1945 allotment to 69 per cent, as compared to 1944. Meanwhile, we all will have to get along the best we know how until the film manufacturers can catch up.

N. J. NESSA, M.D., *Chairman.*
J. R. FUCHLOW, M.D.
J. H. LLOYD, M.D.

Committee on Medical Service and Public Relations

No duties came to our attention during the year and therefore we have no report to make.

N. J. NESSA, M.D., *Chairman.*
T. F. RIGGS, M.D.
G. W. MILLS, M.D.

Committee on Prepayment and Insurance Plans

The council of the South Dakota state medical association, at the annual meeting in May, 1944, decided that the subject of prepaid medical care should receive investigation as to its application in this state. For this purpose the president, Dr. Baughman, appointed the following as a committee on prepayment and insurance plans: H. Russell Brown, chairman, R. E. Jernstrom, R. G. Mayer, C. E. Robbins and C. E. Sherwood. During the year correspondence was carried on among the members of the committee and on two occasions the committee met for consideration of the subject. On Dec. 10, 1944, three members of the committee attended the North Central medical conference at St. Paul, Minnesota, and felt well repaid for the effort and expense of the trip by the information acquired. South Dakota was well represented at that meeting, there being ten of us present, including Dr. Baughman, your president. At this meeting medical men from seven states discussed the economic problems facing medicine. Problems peculiar to each state and the action being taken toward their solution were emphasized.

On the night prior to the council meeting of December 17, 1944, your committee met at the Marvin Huggett hotel in Huron, South Dakota. Also present at this meeting were Karl Goldsmith and Dr. Baughman. The entire subject was discussed at great length and it was the decision of the committee that our first step should be the passage of an enabling act at the then approaching 1945 session of the state legislature, permitting the organization of a corporation to make available medical insurance to the people of South Dakota.

A proposed enabling act, ably prepared by Karl Goldsmith, was carefully studied and then presented to the council at its meeting the following day with the recommendation that it be presented to the state legislature. This was so ordered by the council. A copy of the proposed act is attached to this report.

This enabling act was introduced in the senate where it received favorable consideration. In the house of representatives it died in committee and thus was not enacted into law. Karl Goldsmith will give you the details of the troubles it encountered.

As a result of its consideration of this subject your committee feels that certain points should be emphasized in this report. We all are aware that the people of this country have indicated in public opinion surveys and by other means that they want some method of prepaying medical and hospital expenses, particularly for catastrophic illness or injury. We can be sure also that what the people want they will get in one form or another; that is, by the private enterprise method or by politically influenced, government controlled medicine. At present it is highly probable that we, in medicine, are already too late in promoting and developing plans along this line.

We, in South Dakota, have lagged behind our neighboring states in this general program. As an example of this, consider the development of the Blue Cross hospital insurance. South Dakota is the only state for several tiers in all directions without a functioning Blue Cross plan. At its last session the legislature passed an act enabling the Blue Cross plan to function but the act was so mutilated that it is of little practical value. It is the consensus that no medical prepayment plan is practical without a functioning Blue Cross plan. This applies not only to an insurance corporation that we, as medical men, might set up locally but also to plans available to us by outside underwriters. Such a plan as the latter is available but it cannot be utilized without the cooperation of the Blue Cross hospital organization. Therefore, it seems essential that medical men take an interest in and assist the hospitals in procuring necessary legislation.

The committee feels that it should question the society and the medical men of the state as to what they do or do not want. This question is asked because of the decided lack of interest and support in our legislative program during the last session at Pierre. It seems that most of us were too deeply buried in

our work to worry about our present welfare, much less our future position. As an example of this, house Bill No. 21 was overwhelmingly passed by the other healing professions without an effective opposition by medicine. It appears to this committee that all of us take too little interest in the passage of legislation which is adverse to us and certainly this was very manifest at the last session of the legislature. We cannot depend on the employment of a lobbyist and expect that he alone can accomplish our goals for us.

From experiences in the past year it appears that it would be well for the rank and file of physicians to become better informed upon medical insurance plans. The current medical literature contains many articles on the subject and the American Medical Association can furnish several booklets of value. Until we, as medical men, educate ourselves on this subject and on what is being done in other states, we cannot expect to convince the laity or the legislators of the desirability and the need for adequate legislation to permit the development of this type of insurance.

At the present time, as we all know, conditions in South Dakota are good. People in general have good incomes and are able to finance medical and hospital expense without hardship. We should not fall into the error of assuming because of this that a program of prepayment for medical care is unnecessary. Now, during an era of prosperity, is the time to start such a plan, so that when conditions change, as they will, the people will have that protection.

Your committee advises that every help be offered the hospitals of the state to assist them in developing an adequate Blue Cross hospital plan in South Dakota, believing that this is a prerequisite to the development of any plan for prepaid medical

insurance. We advise also a continuation and intensification of effort to develop a plan of prepaid medical insurance and the passage of any legislation necessary thereto.

H. RUSSELL BROWN, M.D., *Chairman.*
C. R. ROBBINS, M.D.
R. E. JERNSTROM, M.D.
R. G. MAYER, M.D.
C. E. SHERWOOD, M.D.

Advisory to Departments of State Board of Health *Ophthalmology and Otolaryngology*

No report.

Orthopedics

No report.

Social Security

No report.

Maternal and Child Welfare

True to form, this committee has not met nor had any matters referred to it but contrary to form, shall not make the customary lengthy, hypothetical report but merely refer any interested person to the short report of last year.

W. E. DONAHOE, M.D., *Chairman.*
J. E. STUDENBERG, M.D.
E. T. LIETZKE, M.D.

Committee on E.M.I.C.

In regard to the E.M.I.C. I wish to briefly state that as a wartime measure, it has been of great value. I understand that as soon as the emergency is over, the E.M.I.C. program will be automatically discontinued.

R. E. JERNSTROM, M.D., *Chairman.*
W.M. DUNCAN, M.D.
W. E. DONAHOE, M.D.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION ROSTER--1945

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Hofh, S. M.	Yankton
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Triolo, A.	Pierre
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Opheim, O. V.	Sioux Falls
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*Lipton, Maj. Harold	Rapid City		
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Carney, Myrtle Washington, D. C.			
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Gillis, F. D.	Mitchell	Leonard, B. B.	Yankton	Reding, A. P.	Marion
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Gregg, J. B.	Sioux Falls	Lima, Frank	Hoven	Riggs, T. F.	Pierre
Gregory, D. A.	Milbank	* Lipton, Maj. Harold	Rapid City	Robbins, C. E.	Pierre
Groebner, O. A.	Sioux Falls	Lloyd, J. H.	Mitchell	* Roberts, F. J.	Hot Springs
Grove, A. F.	Dell Rapids	★Lovere, S. C.	Humboldt	Rodine, John	Aberdeen
Grove, F. M.	Arlington	Lowe, C. E.	Mobridge	* Rosenstock, Chas.	Hot Springs
Grove, Stuart	Sioux Falls	Mabee, D. R.	Mitchell	★Rousseau, M. C.	Watertown
Gulbrandsen, G. H.	Brookings	Mabee, O. J.	Mitchell	Rudolph, E. A.	Aberdeen
Haas, F. W.	Yankton	Magee, W. G.	Watertown	★Sackett, R. F.	Parker
Hagin, J. C.	Miller	* Maire, Maj. E. D.	Rapid City	Sadock, T. R.	Wagner
Hammond, M. J.	Watertown	Malloy, J. F.	Yankton	★Salladay, I. R.	Pierre
★Hanson, H. F.	Vermillion	Malster, R. M.	Carter	* Sandy, Capt. K. R.	Rapid City
★Hanson, O. L., Jr.	Valley Springs	Manning, F. E.	Custer	★Sawyer, Maj. J. G.	Mobridge
Hanson, O. L., Sr.	Valley Springs	Mannion, J. E.	Gregory	Saxton, W. H.	Huron
Hare, Lyle	Spearfish	Martin, H. B.	Harrold	Saylor, H. L.	Huron
Harris, L. D.	Mobridge	Mattox, N. E.	Lead	Scallin, Paul R.	Redfield
* Hart, B. M.	Los Angeles	Marvin, Thos. R.	Faulkton	Scheib, A. P.	Watertown
Hawkins, A. P.	Waubay	* Mauss, Capt. I. H.	Rapid City	Schuchardt, I. L.	Aberdeen
★Hayes, Paul W.	Hot Springs	Maxwell, R. T.	Clear Lake	Schultz, S.	Phillip
Hedemark, T. A.	Revillo	Mayer, R. G.	Aberdeen	Schwartz, E. R.	Wakonda
Heileson, W. E.	Custer	McBroom, D. E.	Redfield	Serl, W. F.	Sioux Falls
Hendricks, Esten	St. Paul, Minn.	★McCarthy, Paul V.	Aberdeen	Shapiro, Barnett	Rapid City
Hickman, G. L.	Bryant	McDonald, C. J.	Sioux Falls	★Sherman, K. E.	Sturgis
★Hill, W. H.	Centerville	McIntyre, P. S.	Bradley	★Sherrill, S. S.	Belle Fourche
Hills, W. C.	Yankton	★McGonigle, J. P.	Rapid City	Sherwood, C. E.	Madison
Hofer, E. A.	Howard	McGreevy, J. V.	Mitchell	Shirley, J. C.	Huron
Hofer, E. J.	Freeman	★Merryman, M. P.	Rapid City	Smiley, J. C.	Deadwood
Hohf, J. A.	Yankton	* Meyer, Maj. C. A.	Rapid City	Smith, A. J.	Yankton
Hohf, S. M.	Yankton	Meyer, W. L.	Sanator	* Smith, F. C.	Hot Springs
* Hopkins, M. K.	Arlington	Mihiran, M. K.	Rapid City	★Soe, Carl A.	Lead
* Horton, Capt. W. O.	Rapid City	* Miller, Geo. H.	Spearfish	Spain, M. L.	Rapid City
Howe, F. S.	Deadwood	Miller, H. A.	Brookings	Spiry, A. W.	Mobridge
★Hubner, R. F.	Yankton	Mills, G. W.	Wall	Stansbury, E. M.	Vermillion
* Hummer, E. R.	Sioux Falls	Minety, F. W.	Rapid City	Steiner, Peter K.	Yankton
★Hummer, F. L.	Lead	Morehouse, E. M.	Yankton	Stegman, S. B.	Salem
Hyden, Anton	Sioux Falls	Morrissey, M. M.	Pierre	Stenberg, E. S.	Sioux Falls
Jackson, A. S.	Lead	Morseman, C. F.	Hot Springs	Stevens, G. A.	Sioux Falls
Jackson, R. J.	Rapid City	Morse, W. E.	Rapid City	Stevens, R. G.	Sioux Falls
Jacoby, Hans	Huron	Muggly, J. A.	Madison	* Stewart, J. L.	Spearfish
Jacotel, J. A.	Milbank	* Mullen, R. W.	Sioux Falls	★Stewart, M. J.	Sturgis
Jernstrom, R. E.	Rapid City	Murdy, B. C.	Aberdeen	Stewart, N. Wells	Lead
Johnson, Geo. E.	Yankton	Murdy, Robt.	Aberdeen	Struble, A. J.	Centerville
* Johnson, Maj. J. H.	Rapid City	Murphy, J. C.	Murdo	★Studenberg, J. E.	Gregory
Jones, F. D.	Chamberlain	Nelson, J. A.	Sioux Falls	Sundet, N. J.	Kadoka
★Jones, J. P.	Mitchell	Nessa, N. J.	Sioux Falls	Swift, Chas. L.	Martin
Jordan, L. E.	Chester	Newby, H. D.	Rapid City	Tank, M. C.	Brookings
Jorgenson, M. C.	Watertown			Tauber, K. S.	Yankton

Threadgold, J. O.	Belle Fourche
Tobin, F. J.	Mitchell
*Tobin, L. W.	Mitchell
*Torwick, E. E.	Volga
Totten, F. C.	Lemmon
*Townsend, L. J.	Belle Fourche
*Thompson, Arnold	Sioux Falls
Triolo, A.	Pierre
Tschetter, J. S.	Huron
Tschetter, Joseph	Huron
Tschetter, P. S.	Huron

★Member of Armed Forces

*Honorary or Affiliate

x Deceased

‡ Returned to practice.

Unruh, B. H.	Emery
Van Demark, G. E.	Sioux Falls
★Van Heuelan, G. J.	Pierre
Volin, H. P.	Sioux Falls
Waldorf, C. E.	Redfield
Walters, S. J.	Watertown
Watson, E. S.	Brookings
★Wayne, D. M.	Redfield
Weber, R. A.	Mitchell
Weishaar, Chas.	Aberdeen
Westaby, J. R.	Madison

Whitseite, J. D.	Aberdeen
Whitson, G. E.	Madison
Wilkinson, E. A.	Highmore
Willen, Abner	Clark
★Williams, F. E.	Wakonda
Willoughby, F. C.	Howard
*Winkler, Lt. H. A.	Rapid City
Younker, F. T.	Sisseton
★Zarbaugh, G. F.	Deadwood
★Zellhoefer, H. E.	Sioux Falls
Zimmerman, Goldie	Sioux Falls

PHYSICIANS OF SOUTH DAKOTA IN ARMED FORCES OF THE UNITED STATES

Adams, H. P.	Huron
Adams, M. E.	Clark
Andre, Hugo C.	Vermillion
Athey, G. L.	Chamberlain
Auld, M. A.	Yankton
Billion, T. J., Jr.	Sioux Falls
Bliss, R. J.	Sioux Falls
Bloemendall, G. J.	Ipswich
† Boyd, F. E.	Flandreau
Buchanan, R. A.	Huron
Burgess, R. E.	Gettysburg
Bushnell, J. W.	Elk Point
Catey, Robert	Mobridge
Clark, B. S.	Spearfish
Cooper, Geo.	Watertown
Craig, Allen	Sioux Falls
Davidson, H. E.	Lead
Dick, Fred	Vermillion
Dumistra, Fred	Sioux Falls

‡ Returned to practice.

Duncan, C. E.	Pollock
‡ Ferris, W. T.	Chamberlain
Fitzgibbon, T. G.	Sioux Falls
Gelber, M. R.	Aberdeen
Gilbert, F. J.	Belle Fourche
Hanson, H. F.	Vermillion
Hanson, O. L., Jr.	Valley Springs
Hayes, P. W.	Hot Springs
Hill, W. H.	Centerville
Hubner, R. F.	Yankton
Hummer, F. L.	Lead
Jones, J. P.	Mitchell
Kittelson, Otis	Yankton
Kruzich, S. J.	Aberdeen
Lampert, A. A.	Rapid City
Lemley, R. E.	Rapid City
Lovre, S. C.	Humboldt
McCarthy, P. V.	Aberdeen
McGonigle, J. P.	Rapid City
Merryman, M. P.	Rapid City

Nietfeld, A. B.	Sioux Falls
Nyquist, R. H.	Ft. Meade
Olson, Orland	Sioux Falls
Owen, Stanley	Rapid City
Pfister, Faris	Webster
Rousseau, M. C.	Watertown
Sacket, R. F.	Parker
Salladay, I. R.	Pierre
Sherman, K. E.	Sturgis
Sherrill, S.	Belle Fourche
Soe, Carl A.	Lead
Stewart, M. J.	Sturgis
Studenberg, J. E.	Gregory
Thompson, Arnold	Sioux Falls
Tobin, L. W.	Mitchell
Wayne, D. M.	Redfield
Williams, F. E.	Wakonda
Van Heuelan, G. J.	Pierre
Zarbaugh, G. F.	Deadwood
Zellhoffer, H. W. K.	Sioux Falls

WOMEN'S AUXILIARY TO THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Officers

President	Mrs. G. S. Adams, Yankton
President-elect	Mrs. Robert Murdy, Aberdeen
1st Vice President	Mrs. Wm. Duncan, Webster
2nd Vice President	Mrs. H. Russell Brown, Watertown
Recording Secretary	Mrs. J. H. Lloyd, Mitchell
Cor. Sec. and Treas.	Mrs. Myron W. Larsen, Watertown
Past President	Mrs. D. S. Baughman, Madison

Chairmen of Standing Committees

Hygeia	Mrs. G. E. Johnson, Yankton
Bulletin	Mrs. A. J. Struble, Centerville
Legislative	Mrs. C. E. Robbins, Pierre
Organization	Mrs. Wm. Duncan, Webster
Program	Mrs. S. J. Walters, Watertown
Public Relations and Publicity	Mrs. W. G. Magee, Watertown

Historian	Mrs. John C. Hagin, Miller
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South Dakota State Medical Benevolent Committee	
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Chairman	Mrs. J. R. Westaby, Madison
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Secretary-treasurer	C. E. Sherwood, M.D., Madison
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Advisory Council

C. E. Sherwood, M.D., chairman	Madison
J. C. Hagin, M.D.	Miller
J. A. Kittelson, M.D.	Sioux Falls

Advisory Board Meeting

Mrs. G. S. Adams of Yankton was elected president of the women's auxiliary to the South Dakota state medical association at a meeting of the advisory board at the home of the retiring president, Mrs. D. S. Baughman. Other officers are: Mrs. Robert Murdy, Aberdeen, president-elect; Mrs. W. W. Duncan, Webster and Mrs. H. R. Brown, Watertown, vice presidents; Mrs. J. H. Lloyd, recording secretary and Mrs. M. W. Larsen, Watertown, secretary-treasurer. A short memorial service was held in memory of Mrs. H. W. Sherwood of Doland, a charter member of thirty-five years standing: the following obituary was read:

Mary Josephine Camp was born December 12, 1866, in Bryan, Ohio. She spent her girlhood on a farm near Stryper, Ohio. After finishing the country school, she became a teacher and taught for two or three terms. She then went to Detroit, Michigan, and served as an apprentice to a woman's tailor, learning that trade. However, she decided she wanted more education, so went back to Ohio and attended Fayette Normal. There she met and married Horace Watson Sherwood, August 11, 1891. In the fall of 1892 they moved to Ann Arbor, Michigan, living there while her husband went to medical school. After graduation they established their home at Belmore, Ohio. A few years later, feeling they wanted to raise their family in a less thickly populated country, they moved to Doland, South Dakota. Her home was there from 1902 until the time of her death, July 13, 1944. She was the mother of ten children, eight of whom are still living. Of her sons, two became doctors and one a druggist. She was an active member of the Methodist church and Eastern Star.

Mrs. D. S. Baughman, retiring president, read the report which she had made to the national board. It showed that the group had engaged in all but four of the twenty-four war activities suggested by the national women's auxiliary, including: training of nurse-aides; securing of music and musical instruments for hospital ships; organization of Girl Scout teams for the sale of stamps and bonds and making scrap books for hospital ships; making sewing kits for the Red Cross; collection of garments for the clothing drive; making of surgical dressings; taking part in USO work and other community activities related to the war.

Money in the benevolent fund, now amounting to \$1,800, is invested in war bonds, the report showed. It has increased during the year through memorial gifts. (See Benevolent Fund report which follows.)

Membership in the auxiliary now numbers 131, it was reported. There are ten organized and two unorganized districts. The smallest unit reorganized this year and increased its mem-

bership from three to four, making it 100 per cent. The largest unit has 26 members.

The state president visited many districts. These meetings were pleasant experiences and led to a better understanding of auxiliary problems. While in the Black Hills, she called on Mrs. R. D. Jennings, first state president, who is still very active and interested in auxiliary work although 88 years of age. The state president-elect, Mrs. Baughman, attended the national convention at Chicago in June, and the conference in November, and reported that inspiration and information afforded by these meetings cannot be overestimated.

Benevolent Fund Report

This report on the benevolent fund sketches briefly the history of the development of this fund and its purpose and gives a report of its funds.

In 1939 the ladies of the medical auxiliary became interested in the establishment of such a fund following the investigation of similar funds in other states, especially Pennsylvania and Colorado. After a considerable amount of correspondence they decided to establish a fund with the avowed purpose of collecting a sum of money to be used in the assistance of needy physicians or their families. They collected a considerable amount of money from subscriptions and donations and appeared before the state medical association in assembly at Watertown in May of 1940 asking that the state association join with the auxiliary in the joint administration and raising of this fund.

The women's auxiliary amended their by-laws as follows:

A1. The State Medical Auxiliary shall have a committee on Benevolence to aid jointly with a similar committee from the South Dakota State Medical Association as a State Medical Benevolent Committee, which shall have to do with the development and administration of monies for the welfare of indigent physicians and family.

A2. The Auxiliary Committee shall consist of the recording secretary along with a member of the Executive

Board and two members at large, these three being chosen by the Board and to serve for a period of three (3) years each. Long terms are desirable and shall overlap present members retiring in alphabetical order in 1943, 1944, and 1945.

B1. The State Medical Benevolent Committee shall elect its own chairman, secretary and treasurer. This committee shall have in its charge, all relief funds of both organizations and be empowered to enlarge it through subscriptions, legacies, donations and in whatsoever way they may desire and also be responsible for its complete administration, (keeping, investing, expending). It shall be incumbent upon this committee to formulate a set of rules governing and quartering the permanency, safety and confidential aspects of the conduct of this committee and fund. Further, this committee shall make a complete report annually to the executive board of the South Dakota state medical association and the women's auxiliary to the South Dakota state medical association.

On May 25, 1943, \$1,234.50 was invested in bonds with maturity value in 1955 at \$1,675.00. That left a balance in the savings account of \$34.72. The following has been added since that date. June 30, 1943—interest, 5c; July 13, 1943—Madison district auxiliary, \$10.00; December 3, 1943—interest, 10c; June 30, 1944—interest, 15c; July 15, 1944—memorial to the late Mrs. H. W. Sherwood by the staff of Madison Community hospital, \$10.00; December 31, 1944—interest, 96c; March 7, 1945—Pierre district auxiliary, \$10.00; March 31, 1945—interest, 77c; May 11, 1945—Madison district auxiliary, \$10.00, making a total of \$226.87 cash in bank and the bonds cost \$1,239.50, maturity value \$1,675.00.

Contributions made to the fund by the South Dakota state medical association on the basis of 50c per active member have been as follows: May 2, 1941—\$160.00; May 12, 1942—\$153.00; April 10, 1943—\$145.00 and July 15, 1944—\$125.00.

ROSTER, 1945 — MEMBERSHIP BY DISTRICTS

ABERDEEN DISTRICT No. 1

President—Mrs. J. L. Calene	Aberdeen
Secretary—Mrs. R. G. Mayer	Aberdeen
Alway, Mrs. J. D.	Aberdeen
Bruner, Mrs. J. E.	Aberdeen
Bunker, Mrs. P. G.	Aberdeen
Calene, Mrs. J. L.	Aberdeen
Cooley, Mrs. F. H.	Aberdeen
Gelber, Mrs. R. M.	Aberdeen
King, Mrs. H. I.	Aberdeen
Marvin, Mrs. T. R.	Faulkton
Mayer, Mrs. R. G.	Aberdeen
Murdy, Mrs. B. C.	Aberdeen
Murdy, Mrs. Robert	Aberdeen
Pittenger, Mrs. E. A.	Aberdeen
Ranney, Mrs. T. P.	Aberdeen
Rudolph, Mrs. E. A.	Aberdeen

WATERTOWN DISTRICT No. 2

President—Mrs. H. Russell Brown	Watertown
Secretary—Mrs. O. S. Randall	Watertown
Brown, Mrs. H. Russell	Watertown
Hammond, Mrs. M. J.	Watertown
Hubbs, Mrs. Roy S.	Watertown
Jorgenson, Mrs. M. C.	Watertown
Kilgard, Mrs. R. M.	Watertown
Larsen, Mrs. Myron W.	Watertown
Magee, Mrs. W. G.	Watertown
Randall, Mrs. O. S.	Watertown
Richards, Mrs. George H.	Watertown
Rousseau, Mrs. M. C.	Watertown
Scheib, Mrs. Alvin P.	Watertown
Vaughn, Mrs. James B.	Castlewood
Walters, Mrs. Stanley J.	Watertown

MADISON DISTRICT No. 3

President—Mrs. C. E. Sherwood	Madison
Secretary—Mrs. H. A. Miller	Brookings
Baughman, Mrs. D. S.	Madison
Davidson, Mrs. M.	Brookings
Grove, Mrs. E. H.	Arlington

Gulbrandson, Mrs. G. H.	Brookings
Hofer, Mrs. E. A.	Howard
Hopkins, Mrs. N. K.	Arlington
Jordan, Mrs. L. E.	Chester
Miller, Mrs. H. A.	Brookings
Muggly, Mrs. J. A.	Madison
Peeke, Mrs. A. P.	Volga
Sherwood, Mrs. C. E.	Madison
Tank, Mrs. M. C.	Brookings
Westaby, Mrs. J. R.	Madison
Whitson, Mrs. George E.	Madison

PIERRE DISTRICT No. 4

President—Mrs. T. F. Riggs	Pierre
Secretary—Mrs. I. R. Salladay	Pierre
Collins, Mrs. E. H.	Gettysburg
Martin, Mrs. H. R.	Harrold
Morrissey, Mrs. M. M.	Pierre
Murphy, Mrs. J. C.	Murdo
Northrup, Mrs. Frank A.	Pierre
Riggs, Mrs. T. F.	Pierre
Robbins, Mrs. C. E.	Pierre
Salladay, Mrs. I. R.	Pierre
Triolo, Mrs. A.	Pierre

HURON DISTRICT No. 5

President—Mrs. J. C. Shirley	Huron
Secretary—Mrs. J. S. Tschetter	Huron
Buchanan, Mrs. R. A.	Huron
Jacoby, Mrs. Hans	Huron
Lenz, Mrs. B. T.	Huron
Pangburn, Mrs. M. W.	Miller
Saxton, Mrs. W. H.	Huron
Saylor, Mrs. Howard	Huron
Shirley, Mrs. J. C.	Huron
Tschetter, Mrs. J. S.	Huron
Tschetter, Mrs. Joseph	Huron
Tschetter, Mrs. Paul S.	Huron

MITCHELL DISTRICT No. 6

President—Mrs. O. J. Mabee	Mitchell
Secretary—Mrs. J. H. Lloyd	Mitchell

Ball, Mrs. Wm. R.	Mitchell	Minty, Mrs. F. W.	Rapid City
Bobb, Mrs. B. A.	Mitchell	Morse, Mrs. Wm. E.	Rapid City
Bobb, Mrs. C. S.	Mitchell	Newby, Mrs. H. D.	Rapid City
Delaney, Mrs. Wm. A.	Mitchell	O'Toole, Mrs. T. F.	Rapid City
Freyberg, Mrs. F. W.	Mitchell	Spain, Mrs. M. L.	Rapid City
Gillis, Mrs. F. D.	Mitchell		
Lloyd, Mrs. J. H.	Mitchell		
Mabee, Mrs. D. R.	Mitchell		
Mabee, Mrs. O. J.	Mitchell		
McGreevey, Mrs. J. V.	Mitchell		
Tobin, Mrs. F. J.	Mitchell		
Tobin, Mrs. Leonard	Mitchell		
Weber, Mrs. R. A.	Mitchell		

SIOUX FALLS DISTRICT No. 7

President—Mrs. E. E. Gage	Sioux Falls
Secretary—Mrs. H. M. Dehli	Colton
Treasurer—Mrs. L. J. Pankow	Sioux Falls
Billion, Mrs. Thomas J.	Sioux Falls
Brandon, Mrs. P. E.	Sioux Falls
Dehli, Mrs. H. M.	Colton
Donahoe, Mrs. S. A.	Sioux Falls
Erickson, Mrs. Emil	Sioux Falls
Erickson, Mrs. O. Charles	Sioux Falls
Gage, Mrs. E. E.	Sioux Falls
Grove, Mrs. M. S.	Sioux Falls
Hanson, Mrs. Otto A.	Valley Springs
Hyden, Mrs. Anton	Sioux Falls
Kittleson, Mrs. J. A.	Sioux Falls
Lanam, Mrs. M. O.	Sioux Falls
Leraan, Mrs. L. G.	Sioux Falls
McDonald, Mrs. C. J.	Sioux Falls
Nelson, Mrs. J. A.	Sioux Falls
Nessa, Mrs. N. J.	Sioux Falls
Nilsson, Mrs. F. C.	Sioux Falls
Pankow, Mrs. L. J.	Sioux Falls
Reagan, Mrs. R.	Sioux Falls
Serci, Mrs. Wm. F.	Sioux Falls
Stenberg, Mrs. E. E.	Sioux Falls
Stevens, Mrs. G. A.	Sioux Falls
Stevens, Mrs. R. G.	Sioux Falls
Stone, Mrs. James G.	Sioux Falls
Ver Maelen, Mrs. P.	Sioux Falls
Volin, Mrs. H. P.	Lennox

YANKTON DISTRICT No. 8

President—Mrs. J. A. Hohf	Yankton
Secretary—Mrs. F. J. Abts	Yankton
Abts, Mrs. F. J.	Yankton
Adams, Mrs. G. S.	Yankton
Blezek, Mrs. F. M.	Tabor
Brookman, Mrs. L. J.	Vermillion
Duggan, Mrs. T. A.	Wagner
Fairbanks, Mrs. W. H.	Vermillion
Greenfield, Mrs. J. C.	Avon
Haas, Mrs. T. W.	Yankton
Hohf, Mrs. J. A.	Yankton
Johnson, Mrs. Geo. E.	Yankton
Jordan, Mrs. Geo. T.	Vermillion
Joyce, Mrs. Edward	Hurley
Morehouse, Mrs. E. M.	Yankton
Ohlmacher, Mrs. J. C.	Vermillion
Reding, Mrs. A. P.	Marion
Stansbury, Mrs. E. M.	Vermillion
Schwartz, Mrs. E. R.	Wakonda
Strubel, Mrs. A. J.	Centerville

RAPID CITY DISTRICT No. 9

President	(No acting president)
Secretary—Mrs. F. W. Minty	Rapid City
Bailey, Mrs. J. D.	Rapid City
Davis, Mrs. J. H.	Belle Fourche
Dawley, Mrs. W. A.	Rapid City
Hare, Mrs. Lyle	Spearfish
Jernstrom, Mrs. R. E.	Rapid City
Kegaries, Mrs. D. L.	Rapid City
Mills, Mrs. Geo. W.	Wall

Minty, Mrs. F. W.	Rapid City
Morse, Mrs. Wm. E.	Rapid City
Newby, Mrs. H. D.	Rapid City
O'Toole, Mrs. T. F.	Rapid City
Spain, Mrs. M. L.	Rapid City

ROSEBUD DISTRICT No. 10

President—Mrs. R. J. Quinn	Burke
Secretary—Mrs. R. V. Overton	Winner
Lande, Mrs. L. E.	Winner
Mannion, Mrs. J. E.	Gregory
Overton, Mrs. R. V.	Winner
Quinn, Mrs. R. J.	Burke

NORTHWEST DISTRICT No. 11
(Currently non-active)

WHETSTONE VALLEY DISTRICT No. 12	
(Currently non-active)	

Duncan, Mrs. Wm. Webster

*Book Reviews***"BACKWARD, TURN BACKWARD, O TIME!"**

Through the courtesy of Dr. Gilbert Cottam, now of Pierre, South Dakota, the *JOURNAL-LANCET* is in possession of a copy of the proceedings of the first eight meetings (1882-1889) of the Dakota Medical Society as it was called in the days of its founding, before the existence of North Dakota and South Dakota as individual states.

The Society was organized as the Dakota Medical Association at Milbank in 1882. The call for the first meeting was issued by Drs. H. G. C. Rose and O. S. Pine of that city and the meeting was opened June 3 in the parlor of the Grand Central Hotel, Milbank. Minutes reveal that "The meeting was called to order and Dr. A. Grant of Bath was elected temporary chairman and Dr. W. E. Duncan of Ellendale temporary secretary." Subscribers to the constitution and by-laws were Drs. Grant and Duncan, H. G. C. Rose and O. S. Pine of Milbank, S. B. McGlumphy, J. B. Van Velsor and D. Frank Etter of Yankton, L. F. Diefendorf of Aberdeen, J. G. Conley of Elk Point and J. C. Morgan of Sioux Falls. The first paper, read by Dr. McGlumphy, "Our Professional Likes and Dislikes," called for the establishment of a fee-bill.

Two months later the Association met in special session to elect as members Drs. J. B. LeBlonde, Stephen Olney, H. Stites and W. A. Germain of Sioux Falls, O. O. Sawyer of Dell Rapids, M. M. Clark and F. P. Smith of Canton, S. V. Ross of Yankton and A. L. Peterman of Parker. Credentials were received from delegates from the Black Hills Medical society as follows: Drs. Joel Houghton, Hot Springs; D. K. Dickerson, Lead City; J. C. O'Neal, Deadwood; Jos. Van Buskirk, Rapid City. In May 1883 the membership was augmented by Drs. Fredk. Andros and W. E. Crane, Mitchell; S. Austin Brown, Sioux Falls; C. J. Cummings, Montrose; C. P. Bissell, Valley Springs. Bidding for the next annual meeting were Huron, Pierre, Aberdeen, Mitchell and Chamberlain. The new organization seems to have been safely launched.

May 27, 1885, a new constitution was adopted and the name Dakota Medical Society assumed. In 1888 a fee-bill covering surgical operations was adopted with seventy-three items listed and it is unfortunate that space forbids the reprinting of it in this number that it might be compared with the tentative submittance of the Medical Economics committee of the North Dakota State Medical Association which appeared in the August issue of the *JOURNAL-LANCET*.

At the Sioux Falls meeting, June 12, 1890, the name was changed to the State Medical Society of South Dakota. At that time "after eight months of hard and continued labor in collecting and compiling the contents" the proceedings of the society covering the years to date were published, that being the first time they were in print.

The JOURNAL LANCET

Serves the
MINNESOTA, NORTH DAKOTA,

Medical Profession of
SOUTH DAKOTA AND MONTANA

Official Journal of the American Student Health Assn., Great Northern Railway Surgeons' Assn., Minneapolis Academy of Medicine, Montana State Medical Assn., North Dakota Society of Obstetrics and Gynecology, North Dakota State Medical Assn., Northwestern Pediatric Society, Sioux Valley Medical Assn., South Dakota Public Health Assn., South Dakota State Medical Assn.

ADVISORY COUNCIL

North Dakota State Medical Assn.
Dr. James F. Hanna, Pres.
Dr. A. E. Spear, Pres.-Elect
Dr. L. W. Larson, Secy.
Dr. W. W. Wood, Treas.

*North Dakota Society of
Obstetrics and Gynecology*
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MINNEAPOLIS, MINNESOTA, SEPTEMBER, 1945

VACATIONS NOW AND THEN

Summer weather is better adapted to reading than writing, and in pursuit of that pastime we chanced upon a couplet written by Richard Brinsley Sheridan about one hundred fifty years ago that ran like this:

"You write with ease to show your breeding,
But easy writing's curse hard reading."

There was something enigmatic about the expression but suddenly a glint of light uncovered the thought that at first was hidden from one benumbed by the summer heat and poetic arrangements. By taking egotism out of the first line, transposing the last, and finally making use of the converse put in modern twentieth century dress mind you; we would show consideration for the reader rather than the writer by modestly letting our friends in on the secret that "Easy reading's darned hard writing."

Medical journals take no vacations but it is a well established tradition that they urge their readers at least

once a year to do so. With travel restricted as it has been distant trips are not to be considered. It used to be quite feasible to have a fortnight in Europe on a month's holiday including two ocean voyages that to most vacationists were particularly invigorating. The "inner passage" to Alaska was always a popular trip and there is great likelihood that it will be open to tourist travel in another year. A return trip to Skagway and Whitehorse would be interesting from reports of the changes that war activities have brought to these places. A cruise on the great lakes may still be taken without hampering movements of discharges. Cuba is out of the question in planning a summer vacation but this and other points in the Caribbean may well be considered for next winter. February is the best time to see Havana, horse racing to the accompaniment of good band music, and fiestas galore. Independencia day is always celebrated with great pageantry, and once a week before and after that event parades form with colorful floats and gay partici-

pants whose exuberance requires this extended celebration. In Mexico City a light overcoat is a desirable habiment every evening of the year so that makes a good vacation spot any time. The wire grass hazard right smack in front of the first tee at the Mexico City golf course is a challenge to accuracy, distance and height, and after this warning to others we have decided to take a little vacation walk around Lake of the Isles.

A.E.H.

HAVE YOU ANYTHING TO SAY?

For some reason the medical profession has always tended to produce more than its share of writers. Perhaps the psychologists would say this is because its practice demands more repression than others, that the odds are so often stacked against it that the more sensitive of its followers seek in writing release from its frustrations. (Of a certain defunct editor and author it used to be said "if he didn't have his journal he'd have boils"). Or maybe medicine is indeed the art we like to think it and so easily spills over into one of its sister arts. Granted that the writing compulsion differs with heredity, environment and libido, we nevertheless suspect that dozens of our readers are bottling an urge to express themselves on paper, that many have articles bubbling in their systems the release of which would not only bring them inner satisfaction but would inform and stimulate their professional brothers and make their families proud.

A medical journal differs from most other periodicals in that every one of its readers is an actual or potential contributor. This not only makes for a closer relationship between readers and editors but it gives to the latter an added responsibility—a responsibility to encourage new writers and convince them that their papers will be welcomed and receive the same consideration as if written by their state association's president, to renew the enthusiasm of former contributors to the point where they will yield to the prickly urge to come back with an even livelier article.

Medicine as everyone knows is now going through one of the most exciting periods in its history. Medical men of the Northwest, like medical men everywhere, are more on their toes than they have been in years. They are trying out new techniques, testing new drugs, thinking and arguing about the new social problems that have risen to plague them, insurance and prepayment plans, doctor and hospital shortages, relocating returned M.C.s, the stand they should take toward permitting medical refugees to practice within their state. The JOURNAL-LANCET is eager to hear from its readers on all matters, medical and social that pertain to the profession. If its primary function is to publish scientific papers, its secondary is to furnish a common meeting ground for the exchange of opinion and a hearing for every stimulating idea. You may have noticed that from time to time there occurs among our book reviews a report on a book not strictly medical. This is because we subscribe wholeheartedly to the belief that the broader a doctor's horizon the better he will cope with the problems of his community as well as with his patients' individual ills.

As everyone knows who has tried it, writing may be, usually is, hard work, but it is also an exciting and re-creating diversion. An article for the JOURNAL-LANCET presents fewer technical difficulties than do many other types of writing. There is no technique of plot construction, dialogue, characterization to be mastered. True, ability to choose the right word for the right place will have a more subtle influence than you suspect in easing your readers into quiet acceptance of your hypothesis. But if you organize your material in orderly fashion and state your case clearly the style will take care of itself. Always provided, that is, that you have something of interest and unhackneyed to say, and that you avoid in so far as possible what Gill calls "verbal bums," those tempting idle words that actually add nothing at all but confusion to your copy.

Last year a New York publisher offered a prize of \$3,500 in addition to royalties for the best book on medical affairs for laymen. The prize went to Dr. Carl Binger for his *The Doctor's Job*. We don't know Dr. Binger, although his book made us want to, but we are willing to wager that Dr. Binger was as surprised as anyone else to find himself a prize-winning author. Perhaps he began by writing medical papers. You may not be an incipient genius, you may not even win a prize, but if you are an up-and-coming doctor with enthusiasm for your work you cannot fail to have something interesting to say on paper. Your JOURNAL-LANCET offers you an agreeable place in which to say it. So get that paper out of your system. Writing it may save you or your wife "a nervous breakdown," and the chances are you will be surprised to see how good you are.

M. U.

POLIOMYELITIS: THE PATHOLOGY AND ITS CLINICAL SIGNIFICANCE

In 1870, Charcot and Joffroy¹ first pointed out that the pathological changes in poliomyelitis were limited to the anterior horn cells of the spinal cord. Since that time a great deal of literature has been published on this subject. In spite of the fact that these studies have been carried out by many investigators in different countries and laboratories, the reported histopathological alterations have remained amazingly consistent. There remains no doubt that the major pathologic changes in poliomyelitis are in the central nervous system and no scientific investigator has as yet found any evidence to the contrary. Changes do not occur within the skin, subcutaneous tissues, muscles or even peripheral nerves (peripheral mechanism) during the acute stage of this disease, and any change appearing later is invariably secondary to a destruction of the motor neuron.

In poliomyelitis two types of changes are observed within the central nervous system; namely, a mesodermal inflammatory reaction and a nerve cell alteration. The former consists of small hemorrhages, diffuse and perivascular collections of leukocytes and areas of tissue softening and necrosis. These changes, although sometimes very striking in appearance, are actually relatively unimportant from a clinical standpoint since they pro-

duce functional disturbances only by a secondary affect upon the neighboring neurons.

From what has already been stated, it is apparent that the primary nerve cell involvement constitutes the most important pathological alteration in this disease. Such nerve cell changes may result from either the inflammatory changes or from the specific action of the virus upon these cells. This neuronal damage is usually spotty in nature, implicating only scattered neuronal elements within various segments of the cord or certain regions of the brain. The most consistent changes occur within the anterior horns of the lumbar cord and within the cranial nerve nuclei of the medulla. The ultimate fate of the injured neuron will depend upon the severity of its injury. The more severely damaged cells undergo chronic progressive changes and complete destruction. However, the virus does not necessarily destroy all of the injured and non-functioning neurons. In fact, it often produces only partial changes in the affected nerve cells, allowing them to recover within a period of a few weeks or months, depending upon the severity of the original involvement.

The clinical course in poliomyelitis invariably can be correlated with the pathological alterations within the anterior horn cells since it is these cells that innervate the peripheral mechanism. Charcot and Joffroy¹ as early as 1870 emphasized the importance of this neuronal damage and demonstrated its accurate correlation with the clinical paralysis and muscle atrophy. The extent to which clinical impairment will occur in poliomyelitis after paralysis has set in will, therefore, depend upon the extent and severity of the anterior horn cell involvement. Often in cases where the clinical picture indicates a widespread disease process, the cell alterations are mild enough to allow for an almost complete reversal of neuronal disease and a corresponding return of function. When the injured nerve cells undergo irreversible changes, the corresponding functional unit permanently loses its ability to act, regardless of the rapidity and nature of the therapeutic procedures instituted. In such cases the associated peripheral nerves will show evidence of secondary degeneration with ultimate replacement of the degenerated nerve tissues by fibrous tissue. The corresponding muscles will also undergo very rapid degeneration and ultimate fibrosis. This constant correlation between the nerve cell damage and the paralysis and muscular atrophy can best be demonstrated in the more chronic cases of poliomyelitis where one can accurately compare the spinal cord changes, the associated involvement of the peripheral nerves and the distribution of the atrophic non-functioning muscles. Invariably the involved muscles receive their innervation from altered nerves arising from diseased anterior horn cells within the corresponding segment of the cord.

As additional evidence for this specificity of the virus for the central nervous system, one might mention recent studies on the isolation of the virus from various body tissues of persons dying of poliomyelitis.² The results of these tests indicate that the virus is found predominantly in two systems, in certain regions of the nervous system and in the alimentary tract. These studies cer-

tainly add weight to the already proven view that the pathology in poliomyelitis is "central" in nature rather than "peripheral" as has been speculated recently.

A. B. BAKER

¹Charcot, J. A., and Joffroy, A.: Cas de paralysie infantile spinale avec lesions des cornes anterieures de la substance grise de la moelle epiniere, *Arch. de physiol.* 30:134 (1870).

²Sabin, A. B., and Ward, Robert: The natural history of human poliomyelitis: I. Distribution of virus in nervous and non-nervous tissues. *J. Exper. Med.* 73:771 (June) 1941.

News Items

Dr. Walter H. Gilsdorf has moved to Valley City to take up practice there. He has practiced in New England for the past thirteen years.

Dr. Hugh A. McIntosh has arrived in Kenmare after a fourteen months service with the 1st Marine Division in the South Pacific. He will be associated with Dr. David J. Halliday and Dr. Robt. T. Gammell at the Deaconess hospital.

Senator Young has announced that President Truman has signed an authorization for a veterans hospital at Minot.

Dr. I. H. Mauss, Pennington county health officer, gave the examinations at the preschool clinic held in Rapid City, June 13. The object of these preschool clinics is to give every child an opportunity for a physical examination with the hope that discovered defects will be corrected before the opening of schools in the fall. The report discloses that seventy-four children were examined, of whom all but six needed either defects corrected or inoculations. Forty-one others were in need of dental attention.

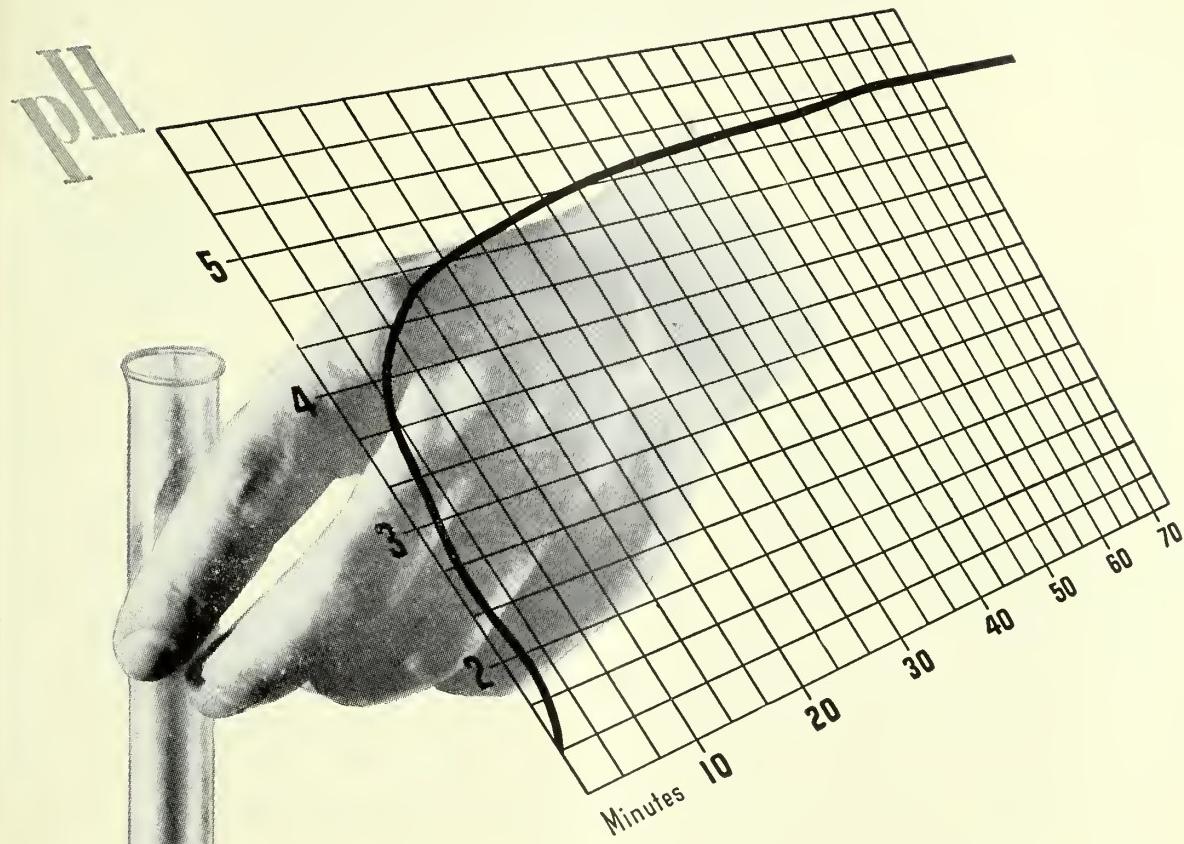
Captain E. L. Wagner of Sioux Falls, flight surgeon, has been awarded the Soldier's Medal for aiding in the rescue of the badly injured crew of a B-24 which crashed in flames at his base in Italy. Captain Wagner served two years with the 376th Bombing Group in Italy and Africa.

Dr. Carl F. Kraenzel, associate professor department of economics at Montana State college and Dr. L. B. Byington of Denver, Colorado, senior surgeon in the federal public health service, spoke at a meeting held at Great Falls on July 13 for the purpose of explaining the anticipated postwar health centers and the inventory of Montana hospitals now under way.

Dr. Harry J. McGregor, Great Falls, has been re-appointed county physician for a one-year term, an office he has held intermittently for seven years.

The Montana State Medical association presented an honorary membership to Mrs. H. W. Peterson of Billings, field commander of the American Cancer society in the northwest states and president of the Public Health league of Montana, for her outstanding work in these fields. In addition, Mrs. Peterson was awarded an honorary membership in the association. The presentation was made by Dr. Jas. C. Shields.

(Continued on page 350)



RAPID DISINTEGRATION — PROLONGED EFFECT

The reassuringly prompt yet long-lasting action of *Improved Syntrogel* makes this Roche antacid the medication of choice for the modern treatment of hyperacidity. Through prolonged adsorption and neutralization of excess acid, *Improved Syntrogel* maintains the pH of the stomach close to the neutral point without inducing an undesirable secondary acid rise. Another outstanding feature of *Improved Syntrogel* is its exceptionally rapid disintegration resulting in unusually prompt relief of pain and distress due to hyperacidity and spasticity. Available in bottles of 48 and 96 tablets . . . HOFFMANN-LA ROCHE, INC., Roche Park, Nutley 10, N. J.

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In Memoriam

Mabel Simis Ulrich, M.D.

1878 - 1945

Death has invaded the sanctum of this journal. During the printing of our August issue our vigorous, cheery, sapient, 67-year-old contributing editor, book reviewer, manuscript overseer and staff writer of clever and penetrating editorials lost her life in a 50 foot fall from a cliff at her summer home, Marine-on-St. Croix, Minnesota.

For a year and a half Dr. Ulrich had devoted many of her precisely organized hours to her editorial work which was her pride and diversion. A posthumous editorial, "Have You Anything to Say?" appears under the masthead of this number. Its candor is typical. The writer's service to this organization was an influence for propriety in treatment and sprightliness therewith. She was a stalwart. Responsibility was inherent in her and no writing task daunted her energy, judgment or clear perception, all of which were extraordinary. For more than twenty-five years she espoused altruistic and progressive causes—women's suffrage, medical advancement, uncensored book distribution, state and regional development, justice to the refugee physician, a voice for the inarticulate, encouragement to the disadvantaged. Judicious and capable, with facile pen and positive personality, she pulled her weight in every performance. Her deft touch and sparkling comment on the written word and her discriminatory reasoning are contributions left as a decidedly valuable deposit here.

Dr. Ulrich was a native of Brooklyn, New York, a graduate of Cornell University and Johns Hopkins University school of medicine, Baltimore, onetime practicing physician in Minneapolis, formerly regional director of American Red Cross for Minnesota, the Dakotas, and Montana, member of the Minnesota board of health, also of the Minneapolis board of public welfare. The Ulrich bookshops in Minneapolis, Duluth and Rochester had given her the high regard and friendship of many authors of renown. On one of her European visits, she collected for publication a series of essays by distinguished women writers of England. She was an appreciated writer for the *Saturday Review of Literature*. She supervised and contributed editorially to the comprehensive volume *Guide to Minnesota*. She had an unfailing sense of the fitness of things, a refreshing objectivity and detection of life's little ironies. Dr. Ulrich is survived by her husband, Dr. Henry L. Ulrich, professor emeritus of medicine at University of Minnesota, and two daughters, Mrs. James Wise of New York and Mrs. Charles Spoerl of West Hartford, Connecticut.

Necrology

Dr. William L. Freeman, 65, St. Cloud, Minnesota, died July 18 after a long illness. He received his degree in medicine at Rush Medical school and came to St. Cloud in 1924 to become associated with the Lewis Stangl clinic. At one time he was present of the veterans' facility of the St. Cloud hospital.

Lt. Earl M. Anderson, 28, Minneapolis, who died in July, was a graduate of the University of Minnesota Medical school in 1941. He was an intern at Minneapolis General hospital, and a fellow in surgery at Mayo clinic, Rochester. He entered the service in 1942.

Dr. Gilbert Leslie Gosslee, 68, Moorhead, Minnesota, died July 14 at a Fargo, North Dakota, hospital after an illness of several months' duration. He graduated from Hamline university and studied at Vienna. He served as health officer of Moorhead for several years and was surgeon for the Northern Pacific railway. During World War I he was a captain in the medical corps.

Dr. Charles J. Lavery, 78, Aberdeen, South Dakota, pioneer physician, surgeon and newspaperman and a resident of Aberdeen for the last thirty-two years, died July 20 at St. Luke's hospital in Aberdeen. Dr. Lavery was born at Chateaugay, New York. His first residence in South Dakota was at Ft. Pierre where he at one time served as mayor and later published the journal *Fair Play*.

NEWS ITEMS

(Continued from page 348)

Dr. Sidney A. Cooney of Helena has been reappointed for another year county physician for Lewis and Clark county. Dr. Howard W. Bateman of Choteau will assist him in the care of the county's extreme northern area.

Dr. Harry E. Bank of Minneapolis, chief medical officer at the United States Veterans Facility at that city, on August 1 was promoted from major to lieutenant colonel. Col. Bank, a native of Minneapolis, is a graduate of the University of Minnesota medical school, class of 1916, and a veteran of World War I. He has been stationed at the veterans hospital at Ft. Snelling since its opening.

Classified Advertisements

ASSISTANCE AVAILABLE

Aznoe's, established in 1896, has available a number of well trained physicians (diplomates of the specialty boards, industrial physicians and surgeons, general practitioners, psychiatrists, tuberculosis specialists and residents). For histories, write Ann Woodward, Aznoe's-Woodward Medical Personnel Bureau, 30 North Michigan Ave., Chicago 2, Ill.

FOR SALE

Medical outfit in southeast North Dakota, community of 2000 population. For particulars address Box 823, care of this office.

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WITH *White's*

SULFATHIAZOLE GUM*

in Oropharyngeal Infections

One tablet of
White's Sulfathiazole Gum
chewed for
one-half to one hour

1. promptly provides a high salivary concentration of locally active (dissolved) sulfathiazole
2. that is sustained throughout the chewing period in immediate contact with infected oropharyngeal mucosal surfaces,
3. yet even with maximal dosage, resulting blood levels of the drug remain so low as to be virtually negligible.

INDICATIONS: Local treatment of sulfonamide-susceptible infections of oropharyngeal areas; acute tonsillitis and pharyngitis; septic sore throat; infectious gingivitis and stomatitis; acute Vincent's disease.

DOSAGE: One tablet chewed for *one-half to*

one hour at intervals of one to four hours depending upon the severity of the condition. If preferred, several tablets—rather than a single tablet—may be chewed *successively* during each dosage period without significantly increasing the amount of sulfathiazole systemically absorbed.



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Advertisers' Announcements

"YOUR DOCTOR SPEAKS"

War-busy physicians who would like to interpret many medical developments to their patients but are prevented by the sheer lack of available time, will be interested in the broad new educational campaign created by The Upjohn Company and the subject of editorial treatment in Life magazine's issue of May 13. The campaign takes recent medical developments, often of life-saving value to the American public, and presents the facts simply and attractively. The effort is made to give information of immediate practical help, based on sound medical principles, and carrying a hopeful note.

Each message has been carefully checked by leading authorities of the particular field, not only for accuracy but also for the wisdom of the presentation of the facts to the consumer. Assistance in framing the messages and enthusiastic approval of the campaign have been expressed by medical leaders.

Throughout 1945, messages will appear on pneumonia, pregnancy, cancer, whooping cough, stomach ulcers, the menopause and other vital health subjects of immediate interest. They will say in simple language what the physician might tell his patients if he had the leisure to do so.

In each message, the physician is presented as authoritative, yet still a warm human being. He frankly asks for cooperation from his patient so that together they can vanquish disease. Many readers who may be remote from their accustomed family physician, will no longer feel so isolated when they recognize that all doctors are grouped together to bring the benefits of modern medical discoveries to all.

MINNESOTAN PROMOTED IN SCHERING ORGANIZATION

In connection with the appointment of Dr. Jno. N. McDonnell to the newly created post of director of domestic sales and promotion, Schering Corporation of Bloomfield, N. J., announces the advancement of Herman W. Leitzow to assistant to Dr. McDonnell. Dr. McDonnell for the past four years has been head of research of the drugs branch of the WPB.

A native of Minnesota and a graduate of the state university, Mr. Leitzow engaged in retail drug practice for a number of years before joining the Schering staff. Schering offices are in downtown Bloomfield, and plants for the manufacture of endocrine and pharmaceutical preparations are in the industrial section of Bloomfield and at Union, N. J.

Mr. Geo. C. Straayer, manager of the company's professional service division and well known to physicians of the northwest for his years of service to Schering in this section will continue in that post and in addition will devote part of his time to the development of field operations for the company. He received his business and professional training in Michigan. He has been associated with Schering since 1939.

HIGH POTENCY VITAMIN B COMPLEX

Poly-B, the U. S. Vitamin Corporation's vitamin B complex available in capsule and syrup forms, represents substantially increased potency. Each capsule or each teaspoonful of syrup (5 cc.) affords Vitamin B₁ (thiamine hydrochloride) 3 mg.; Vitamin B₂ (G, riboflavin) 3 mg.; niacinamide (nicotinamide) 20 mg.; Vitamin B₆ (pyridoxine) 1 mg.; calcium pantothenate 3 mg., and small amounts of natural B complex from brewers' yeast extract and liver concentrate, two of the richest natural sources of Vitamin B complex. Parenteral Poly-B Special, for intravenous and intramuscular use, has not been overlooked in the potency elevation of its vitamins B₁, B₂, B₆ and niacinamide content, and addition of calcium pantothenate.

Vi-Litron issued as capsules and syrup, is another U. S. Vitamin Corporation product which is today higher in potency for the treatment of secondary anemias, particularly those associated with nutritional deficiencies. Vi-Litron capsules combine a high concentration of the anti-secondary anemia fraction of liver with good potencies of ferrous sulfate, fortified with Vitamins C, B₁, B₂(G) and niacinamide. Vi-Litron syrup offers a similar formula containing iron peptonate, pantothenic acid and Vitamin B₆.

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● You have a dependable treatment for menopausal symptoms when you administer a dependable solution of estrogenic substances.

● For this delicate task, Solution of Estrogenic Substances, Smith-Dorsey, has won the confidence of many physicians. Smith-Dorsey Laboratories are fully equipped, carefully staffed, qualified to produce a medicinal of guaranteed purity and potency.

● With this product, you can help to steady many of those "fitful blazes."

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vials representing potencies of 5,000, 10,000
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The JOURNAL LANCET

Minneapolis, Minnesota
October, 1945

Vol. LXV, No. 10
New Series

Thyrotoxicosis*

Harry O. Drew, M.D.
Billings, Montana

DURING the sixteenth and seventeenth centuries the Italian and Dutch artists began to depict the human face and form as they saw it and not according to classical tradition. In other words the artist reproduced what he saw. In the art works of this period are many pieces showing recognizable diseased conditions. Recently in one collection of works of this period I saw two unmistakable examples of exophthalmic goiter. One was a marble statue of the head and shoulders of a young woman done by a Florentine artist in 1660. It showed widely staring eyes and a distinct tumor mass on the neck. The other was a painting of a young woman of the French court during the time of Louis XIV. There was pronounced exophthalmos and a distinct goiter was on the neck.

When we recall that the first medical record of this condition was the description given by Parry in 1786 in which he described five cases of heart disease with an enlarged thyroid gland and protrusion of the eyes, and the next description was by Graves in 1835, we wonder why it was not described before. The artists were depicting the condition nearly two hundred years before these dates.

There seem to have been nearly as many classifications of goiters as of the nephritides. The principal concern clinically is whether the patient has hyper or hypothyroidism. The terms applied to various enlargements of the thyroid gland as hyperplastic, toxic nodular, non-toxic nodular, exophthalmic or adenomatous goiter are all descriptive of various phases of the same pathological processes. Aside from purely physiological hypertrophy which results from a temporary over-activity of the

gland, these various phases of glandular growth are due to hyperplasia and hypertrophy followed by involution. The areas of involution undergo various degenerations and give rise to uneven and nodular masses palpable on the surface of the gland. They may occur in any lobule and at times are indistinguishable from cancer. These areas of involution may cause pressure symptoms, but their ability to cause toxic symptoms is doubted. They seem to be burned out areas of hyperplasia and are evidence of past over-activity in the gland. If such a gland is giving evidence of hyperactivity it is coming from some area of hyperplasia or hypertrophy.

The classical symptoms of thyrotoxicosis—rapid heart, nervousness, tremor and an elevated metabolism in the presence of an enlarged thyroid gland—are easily recognized. One of the outstanding symptoms of some cases is the effect on the eyes. Bram claims that from 60 to 85 per cent of all cases of thyrotoxicosis will develop some type of exophthalmos.⁴ Thompson says that puffiness of the eye-lids is as diagnostic as exophthalmos.²⁴ When eye symptoms accompany the symptoms of hyperthyroidism we call the condition Graves' disease. Means points out that to call the disease exophthalmic goiter is a misnomer because there may be no exophthalmos present, or if it is present there may be no goiter; toxic goiter will not do because they are not always toxic. As the etiology is not definitely known, he thinks Graves' disease should be used.⁹

The symptoms alone may be misleading. In these days of war neuroses and intense worries over loved ones on the battle fronts of the world, it is not surprising to see many of the symptoms of hyperthyroidism if we are looking for them. Eppinger and Hess pointed out in 1915 "the possibility must be advanced that certain ques-

*Read at a meeting of the Billings Clinical association, April 20, 1945.

tionable and atypical forms of thyroid disease may in reality be vagotonia."¹ Again, we may be dealing with one of the milder psychoses. Bateman has recently pointed out the similarity between schizophrenic types and thyroid disease.¹²

Recent advances in knowledge of thyroid physiology have given us some plausible explanations of Graves' disease as well as some leads in the problem of endemic goiter. The discovery that thiocyanate medication in hypertension would cause enlargement of the thyroid and that many sulphur-containing drugs would affect thyroid secretion as well as the metabolic rate, has caused a flurry of investigation of the whole subject of thyroid physiology.

For many years thyrotoxicosis was looked upon as purely a diseased condition of the thyroid gland in which an over-secretion of thyroid hormone gave us all the symptoms. The answer seemed easy. Remove the greater portion of the gland and the supply of hormone is cut off and the patient becomes normal again. As we learn more about this strange disease which causes the reactions of and in every way simulates intense fear, we see, as in many other disease complexes, that the answer is not simple.

It has been long thought that the onset of hyperthyroidism was due to direct nervous stimulation of the thyroid gland. As Bram and many others have pointed out, many cases give a history of some intense emotional stress before the symptoms develop.⁴ After the work of Friedgood and Canon, in which they developed all the symptoms of exophthalmic goiter in laboratory animals by anastomosing the phrenic nerve with the cervical sympathetic, it looked as if nervous stimulation of the autonomic system was a major factor in the disease. Also, bilateral cervical sympathectomy will cause a lowering of the metabolic rate in animals. However, when we consider that the thalamus controls the autonomic system, this reaction means that with a portion of central control cut off, the overstimulated autonomic quiets down. While we unquestionably have nervous control of the thyroid gland, it is indirect and humoral by way of the "pituitary-thyroid axis," as it is called by Salter.

When we look at the activity produced in the organism by thyroxin we find that it is manifold. Besides stimulating metabolism of the body tissues which include oxidation and the activity of enzymes in the cell, Means points out that it acts on the "distribution and exchange of water, salts, and colloids of the body, upon hepatic glycogen stores (which are depleted under an excess of hormone), upon circulation (which is accelerated), upon the nervous system (which is rendered more irritable), and others."³ However, in thyrotoxicosis, there are a number of other conditions which an over-secretion of hormone does not explain. Williams and Kendall have shown that thyroxin activity is intimately bound up with the amount of thiamine in the diet.⁶ In the presence of thiamine deficiency large doses of thyroid extract have very little effect on basal metabolism. When this deficiency was remedied, the usual increase in basal metabolism was obtained. The enlargement of the thyroid gland or the goiter itself and the exophthalmos seems to

be traceable to the activity of the thyrotropic hormone of the pituitary.

The internal secretion elaborated by the thyroid is intimately bound up with iodine metabolism. This secretion of the gland is a complex chemical consisting of globulin and iodine in varying combinations. It exists in the gland as thyro-globulin. The thyroglobulin in the presence of inorganic iodine breaks down into diiodotyrosine and thyroxin probably by the action of an enzyme.^{2,3} These are both found in the circulating blood in combination with other proteins, and thyroglobulin is not. Thyroglobulin, thyroxin, and diiodotyrosine have at various times been considered as the active hormone. However, diiodotyrosine has been shown to be physiologically inactive and is an intermediate product between thyroglobulin and thyroxin.

Delicate assay methods have been perfected by which the various iodine fractions in the blood can be determined.³ By these methods it has been shown that the total iodine fractions in the blood normally vary from 5 to 15 micrograms per hundred cc. of blood. In hypothyroidism the values are 2 to 5 micrograms, while in hyperthyroidism they may be as high as 110 micrograms. Normally the iodine fractions are equally divided between free iodine, diiodotyrosine and thyroxin. In hyperthyroidism the thyroxin fraction is greatly increased. To date these assay methods have not been sufficiently simplified to be of practical clinical use.² When they are, they will prove more accurate than the basal metabolism test.

Thyroxin is looked on as the active hormone of the thyroid. Very recently it has been found that this hormone can be very easily made in the laboratory by incubating blood proteins, egg albumen, or casein with iodine. It has been found to be one of the easiest hormones to synthesize. The iodo-casein so formed has been found to be much more active than thyroglobulin, and when hydrolyzed yields a substance eighty times more active than an equal weight of dried thyroid gland. As Soskins points out, with the ease with which thyroxin can be synthesized, it becomes evident that it can be made by tissues of the body outside of the thyroid gland because the administration of inorganic iodine will raise the basal metabolic rate of thyroidectomized animals and myxedematous humans.^{2,5}

By the use of radio-active iodine it has been found that the thyroid gland accumulates iodine eighty times faster than the rest of the body tissues, showing that there is a selective activity that the rest of the body lacks. In hyperplastic glands the selective rate may be from three to four hundred times greater than that of other body tissues.³

Reineke and his co-workers have shown that the progressive iodination of casein produces compounds with progressively greater thyroid activity. This holds true until the iodine content reaches 7 per cent. After this figure the thyroid activity of the compounds was progressively reduced.⁷ If this holds true in the body, this may be the reason for the paradox of reducing metabolism by the flooding of the system with iodine in the presence of hyperthyroidism. It could also explain why

in some cases of colloid goiter with low basal metabolic rate, the administration of iodine can cause an exacerbation of hyperthyroidism.

The effect of the pituitary gland on the thyroid was suspected for a long time because of some of the changes caused by pituitary disease. In recent years with development of processes whereby the thyrotropic substance can be separated from the gonadotropic, adrenotropic and the growth-promoting factors of the anterior pituitary extract, much has been learned of its activities. This thyroid stimulating substance or TSH as it is called has been found to be a protein and has not been synthesized. It is eliminated in the urine and by processes of bioassays the amount can be determined.

When TSH is administered parenterally it causes marked activity of the thyroid epithelium and a discharge of the colloid from the follicles with all the evidences of increased thyroxin activity including an elevation of the metabolic rate. In 1936, when Hertz and Oastler found TSH in urines of myxedematous patients and none in normal or thyrotoxic individuals it seemed paradoxical.⁸ However, Rawson was able to show that it does occur in the urine of both normal and thyrotoxic individuals, but in an inactivated form. Heating reactivates it and it was found to occur in amounts proportional to the amount of thyroid activity. When TSH is brought into contact with thyroid tissue in the test tube, it is found that thyrotoxic tissue has a greater power to inactivate it than normal tissue and that tissue from a non-toxic nodular goiter apparently has no effect on it.⁹ The inactivation of TSH seems to be an oxidation due to enzymic activity of the thyroid cell and not due to the action of thyroxin. In other words it is not a question of one hormone neutralizing another. The direct effect of TSH on the thyroid gland seems to be the same as the effect of the thyroid hormone on the body cells. In the presence of an over-production of TSH there results a hyperplasia of the thyroid and an overproduction of thyroid hormone.

Under normal conditions there seems to be a balance between the pituitary and the thyroid gland. Underactivity of the thyroid from any cause seems to stimulate the pituitary to produce more TSH and over-activity of the thyroid seems to depress the production of TSH. There seems to be an over-production of TSH as well as thyroxin in thyrotoxicosis. Does this mean that the pituitary-thyroid axis has become unbalanced from the pituitary end? Means says there is no evidence pathologically of hyperplasia of the pituitary gland found in Graves' disease.⁹ However, from the work of Rawson and others, there is definite evidence of an increased excretion of TSH found in the urine of thyrotoxic patients. If the primary cause is over-stimulation of the pituitary, we must explain where such a stimulus could come from. Here we may recall the direct connection between the pituitary and both the autonomic and central nervous systems, with the hypothalamus by way of the pars nervosa. This could also explain the connection with the history so often obtained of emotional stress before the disease develops. We cannot overlook this fact in spite of such statements as "Certainly the disease is not psy-

chogenic in origin" and "it is a chemical disturbance. Psychiatrists have developed a great variety of peculiar explanations for many diseased states. After reading some of these explanations one is almost forced to the conclusion that they belong in the realm of star-gazing."²⁶

Since the development of a fairly pure extract of TSH, several interesting things have been explained.¹¹ Not only is it possible to develop typical Graves' disease in laboratory animals, but that unexplained and mysterious eye condition of exophthalmia could be developed. This condition could be more easily produced in thyroidectomized animals than in normal ones.⁹ Apparently TSH has a selective action on the contents of the orbit and this seems to explain why the exophthalmia is either unchanged or made worse in some cases of Graves' disease after thyroidectomy. It probably is the explanation of those cases reported in the literature, of hypothyroidism to whom thyroid extract has been given, and who develop marked exophthalmos.¹⁰

Some of the accompanying symptoms of Graves' disease have been explained by some investigators as due to vitamin deficiencies. Soskin and Levine have produced a chart listing many of these symptoms and their relationship to various vitamin factors.² They list central nervous system effects as tremor, etc., as due to thyroxin activity in the presence of vitamin B deficiency, creatinurea as due to thyroxin in the presence of vitamin C deficiency, loss of calcium due to thyroxin and vitamin D deficiency, loss of glycogen stores as due to vitamin B deficiency, muscular weakness as due to pyridoxine deficiency, etc. It seems very likely that this may all be relative, due to the increased demands for food in the presence of the elevated metabolism, and caused by excessive thyroxin.

In the last three years investigations of the activities of the thiocyanates, sulfonamides, thio-urea, and thio-uracil on the thyroid gland has brought out many interesting things pertaining to its physiology. These substances will all cause hyperplasia of the gland and a reduction of metabolism. Apparently the hyperplasia is due to the stimulation of the pituitary gland.¹³ The increased amount of TSH demands more thyroxin, the available supply is exhausted and in the attempt to make more, the hyperplasia develops. The thiocyanates seem to block the formation of thyroxin within the gland unless in the presence of an excess of iodine. If either iodine or thyroid extract is given with these drugs, the reduction of metabolism and the hyperplasia does not develop.³ With the sulfonamides, thio-urea and thio-uracil, the giving of iodine has no effect either on the hyperplasia or the metabolism; the administration of thyroid extract with these drugs will prevent these changes, showing that they block the synthesis of thyroxin at a different point. Means has likened the activity of the thyroid gland to an assembly line turning out thyroxin and these sulfur-containing substances cause "bottlenecks" at different places within the gland. The hyperplasia of the gland is caused by a demand upon it which it cannot meet and we get a hyperplasia of frustration. Metabolism is reduced because of the exhaust-

tion of the available supply of thyroxin.^{3,13} When the amount of thyroxin is either exhausted or very low the TSH is not inactivated and exophthalmos may develop.¹⁴ When radio-active iodine is given to patients in which thio-uracil has produced the above results it has been found to be excreted in very large amounts, showing the inability of the gland to utilize it.¹³ The goitrogenic effect of these substances could not be obtained in hypophysectomized rats as reported by the MacKenzies and by Astwood.¹³

After it had been definitely proven that basal metabolism could be reduced and the symptoms of hyperthyroidism controlled in laboratory animals, it was a natural step to use some of these substances as therapeutic agents in thyrotoxicosis in man. Thio-urea was chosen because it was found to be quite nontoxic in animals. Astwood reported a few cases in 1942 and it was found that when continued over a period of several weeks improvement in all of the symptoms occurred. When other closely allied substances were investigated it was found that thio-uracil was much more active and the by-effects of nausea and disagreeable breath were not obtained. When Astwood reported his results of the use of thio-uracil in 1943, he warned of the danger of toxic reactions from the use of this drug.¹⁶ Since that time there have been many reports from competent observers and this warning has been amply justified. Several deaths from agranulocytosis have been reported.¹⁷ The usual toxic reactions which have been reported are nausea, jaundice, dermatitis, edema, swelling of the salivary glands, elevated serum chlorides, fever, leucopenia and agranulocytosis.¹⁶ In some series of cases reported the percentage of reactions seems quite high. Gabrilove and Kert report they had serious reactions in three of nine cases treated.¹⁸ There is evidence that thio-uracil passes through the placenta and can cause changes in the fetus. Williams reports such changes in rats born to females that had been fed thio-uracil.²¹ They were of small size and had developed goiters. Eaton reports the case of a mother who had been treated with the drug for thyrotoxicosis until shortly before delivery and who gave birth to a child with an enlarged thyroid gland.²² Many of these toxic reactions can be avoided by the use of smaller doses and by the use of a combination of the drug with iodine or thyroid extract.^{22,23,25}

In spite of the toxic reactions so frequently reported with thio-uracil (Williams says 10 per cent),²³ it is being hailed as a boon to patients who have a mild degree of thyrotoxicosis or who are poor operative risks. Probably some substance closely allied to thio-uracil will be found which will not give such a high degree of reactions.^{15,23} While the drug seems to be more efficient in controlling the symptoms of thyrotoxicosis than iodine, its effect on the gland itself has been a cause of concern. A large percentage of the glands become larger, more vascular and there is a lymphocytic infiltration.^{13,23} (This condition as described bears some resemblance to struma lymphomatosis or Hashimoto's disease. While true Hashimoto's disease or Reidel's struma with its board-like hardness is seldom encountered, it is not uncommon for the pathologist to report a chronic thyroid-

itis with lymphocytic infiltration. These are hyperplastic glands from patients who have been intensely treated with Lugol's solution. Thio-uracil may not be the only substance which causes lymphocytic infiltration of the thyroid.) These changes can be somewhat overcome by giving iodine with the drug.^{20,23,25} Those who have used the drug as a preoperative treatment seem to think the postoperative course is more comfortable and that the period of hospitalization is shorter.^{13,20,22,23,25} As would be expected, the effect of thio-uracil on the exophthalmos is the same as with other forms of treatment. In the milder cases there is improvement, in the malignant type they get worse.²³

The great fault found with surgery as a treatment of thyrotoxicosis is that it is purely symptomatic and does not cure the underlying cause of the disease. This is readily admitted by all surgeons. However, this new medical treatment with thio-uracil seems to have the same fault. It blocks the formation of thyroxin and the symptoms only are brought under control. Surgery does so quickly, with a risk in good hands of a mortality under one per cent. Treatment with thio-uracil with toxic reactions running as high as ten per cent and the development of agranulocytosis as high as one per cent, certainly is not devoid of danger.

All of the new advances made in the physiology of the thyroid gland tend to show more and more that the cause of thyroid hyperactivity is controlled by the thyrotropic hormone of the pituitary. There seems to be every reason to believe that the pituitary is under control of the central nervous system by way of the hypothalamus. Until we have some means of controlling the impacts of emotional stresses on the brain, we will have to continue to treat Graves' disease symptomatically. Means very aptly says, "According to the nature of our constitutions one of us may fail to adjust to his environment in his endocrine system and develop Graves' disease, another in his gastro-intestinal tract and develop an ulcer, yet a third in his circulatory system and develop irritable heart or effort syndrome."⁹

What about thiocyanate goiter? Here we have an enlarged thyroid gland which develops because the synthesis of thyroxin is interfered with. It can be prevented by the use of iodine and the enlargement of the gland seems to be caused by a lack of a normal amount of iodine reaching the thyroxin stage. Could not some such mechanism be at work in endemic goiters, which can be controlled by the administration of iodine? The metabolism of some food factors may be the cause of some such change taking place as happens when the thiocyanates are given as medication. It seems to me that there is a close analogy between these two types of goiters.

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Medical Leadership in Public Health*

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THE responsibility of safeguarding the health of the people residing within a state devolves primarily upon the health department of that state. The health department which discharges this responsibility fully must have at all times the enthusiastic support of the people served. Since the executive officers of the state health departments are members of the medical profession, organized medicine should always give enthusiastic support to the state health department's program. If it is the responsibility of the state health department to safeguard the health of the people, why then should the U. S. Public Health Service be interested in local health service? There are two reasons for this.

First, national defense is a definite responsibility of the federal government. Safeguarding the health of the civilian population in time of war is regarded as a definite and integral part of a national defense program. Hence, the federal government, through the U. S. Public Health Service, is discharging its legal responsibility in this field.

Second, by an act of Congress, the U. S. Public Health Service is charged with the responsibility of preventing the interstate spread of disease. Manifestly, it would be folly for the Public Health Service to throw a cordon of officers around each state for the purpose of preventing the spread of diseases from one state to another. For more than 25 years, the Public Health Service, in cooperation with the various state health departments, has endeavored to determine how best to prevent the interstate spread of diseases. After years of trial and experimentation, it has been definitely determined that the best method of preventing the interstate spread of disease lies in controlling a disease at its source. To achieve this result, local public health machinery is needed. Through years of cooperative effort it has been found that the agency par excellence for achieving this result is the local health department, manned by well-trained and experienced personnel who devote their entire time to the task of preventing disease and to the promotion of sound health programs. As a result of the co-

operative federal-state health services in many of the states, Title VI of the Social Security Act was passed in 1935, and funds thereunder were made available for cooperative health work in 1936. At long last, the Public Health Service is in a position to pay the local health department for rendering invaluable service in the matter of preventing the interstate spread of disease. As a result of the passage of the Social Security Act, there has been a phenomenal expansion in certain areas of the United States of full-time local health services. In 1942 the people of 1,828 out of 3,070 counties were enjoying the benefits of some type of full-time local health service. The need for further expansion becomes acutely apparent when the broad public health needs of this country are taken into consideration.

Improvements in the field of public health during the past quarter of a century have been little short of miraculous. These results have been accomplished with rather poorly organized and improperly integrated public health services. As a result of organized community action, typhoid fever, iliocolitis, diphtheria and whooping cough have, for all practical purposes, been eliminated as major public health problems. Great progress has been made by organized effort toward reducing the morbidity and mortality rates from tuberculosis. With recently developed methods of case-finding, and expected improvement in treatment facilities and technics, this disease should within the not distant future cease to be a major public health problem. Pneumonia, the captain of the men of death, bids fair to yield its death-dealing hold on the human family, as a result of the march of science, with its chemical weapons of action. Recent discoveries of methods of treatment of the venereal diseases offer a very favorable prognosis for early control of these diseases. Recent statistics released by the Bureau of the Census show that the general death rate for the United States for the year 1942 reached a new low of 10.3, and that the infant and maternal death rates for the same year were the lowest in history. All these results have been accomplished by organized community effort, fostered and promoted by public health agencies, both official and unofficial, and participated in very actively by

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members of the organized medical and allied professions. It may be stated parenthetically that any public health program, to be eminently successful, must be actively supported by the medical and allied professions.

Lest this brief review of the success which has been achieved during the past few years should generate a feeling of self-satisfaction and complacency, attention is here directed to some problems of public health which clamor for solution. The physical unfitness of the men called to active duty under the Selective Service Act of World War Number Two should cause all of us who are interested in the advancement of medical science a definite sense of humiliation. Forty-six per cent of the first two million men examined under this draft were labeled unfit for military service. To be sure, the physical standards in the beginning were rather high. Yet, with the lowering of the standards, more than one-third of the men between twenty and thirty-eight were declared physically unfit. A detailed study of the causes of rejection reveals the fact that a large percentage of these rejectees would have been physically fit if they had availed themselves of the scientific services which the medical profession was capable of supplying. For a number of years the medical profession has been warned that a large proportion of the people did not get proper medical care. For years it has been known that eyes, teeth, venereal diseases, and mental hygiene were subject to serious neglect. Propaganda from high places has lulled to sleep the medical profession by the assurance that the American people are the healthiest people on earth and that medical service of the best grade in the world was available to them. The revelation of the draft indicates how adroit the deception has been. It is evident that there has been a terrific lag between scientific medical discoveries and the practical application of those discoveries to the people at large. Several factors may be responsible for this lag.

In the first place, it may be due to the fact that the general public has not been thoroughly informed relative to the advantages to be derived from the practical application of these discoveries. It is the function of any well-organized health department to acquaint the general public with the scientific public health facts in such a manner that practical application will be made of the information thus obtained. The personnel of the health department should function as a liaison agent between the general public and the medical and allied professions. The state and local health departments may be responsible for a considerable amount of this lag.

Another factor which may have contributed to this lag may be the failure of some members of the medical profession to keep abreast of the serious need and to supply the general public with the services required. The rapid growth of medical knowledge and the general competence of the profession has made it natural for the people to look to physicians for advice with respect to the prevention and cure of their ills. This same rapid accumulation of medical knowledge also makes it impossible for one physician to master the entire field. For this reason, the practice of group medicine, where the patient may have the advantage of several types of serv-

ices, should become increasingly popular with the general public.

Still another factor, and probably one of the chief factors in the causation of this lag, is the lack of funds with which to pay for reasonably adequate service. The committee on the cost of medical care, in a survey in 1929, the peak year of prosperity, found that 59.5 per cent of the families had an annual income below \$2,000. The National Health Survey, made in 1936, has shown that in the United States there are forty million people in families having a total annual income of less than \$800. Among this group it was found that almost eight million cases of illnesses were receiving inadequate care, and that approximately two million of these most serious illnesses received no medical care at all. From these family income figures, it can readily be seen that in approximately one-third of the population one case of catastrophic illness would be sufficient to throw a member of this class into the relief group. It is manifestly impossible for the medical profession to assume the responsibility for caring for this terrific illness load without any thought of remuneration. How definitely to solve this problem in an American way is a task which confronts the medical profession, as well as the statesmen. The mere fact that medical societies are now discussing and experimenting with various plans for delivering medical care to those in the low income group indicates that the leaders in that profession are giving serious consideration to this problem and augurs well for its final satisfactory solution.

In promoting the establishment of reasonably adequate full-time local health departments, either county or district, one often meets with the rather hackneyed statement in certain areas of the United States that, "This is the entering wedge to State medicine." This statement is still being made, in spite of the fact that the American Medical Association has gone on record in favor of this procedure. On June 10, 1942, the House of Delegates of the American Medical Association unanimously voted its approval of the extension of this type of service. There was published in the *Journal of the American Medical Association*, April 3, 1943, a lengthy editorial advocating enthusiastically the expansion of full-time local health services throughout the length and breadth of the United States. The closing paragraph of this editorial reads as follows: "The career of public health as a specialty of medicine requiring graduate university training and practical experience is so far accepted as a part of the pattern of preventive medicine that the survival of the part-time general practitioner as the local administrator of a health department cannot be encouraged by the medical profession or be recommended to the taxpayer as the best his money can buy in public health."

Attention is here called to the fact that in two states (Alabama and South Carolina) the state medical association has been designated by law as a state board of health. It is of interest to note that at the outbreak of the present war the people of all the counties in both states were enjoying the benefits of whole-time local health service. The medical associations in both states have led constructively in the field of public health, and

the people have gladly followed that leadership. Should state medicine develop in the future, it is felt that organized medicine in those states will be in a position to assume direct leadership in that field, since it has already demonstrated its ability to lead constructively in one important field. In such an event, what will be the status of organized medicine in those states where this ability for leadership has not been tried and demonstrated?

It is seriously recommended that the organized medical profession of this state take definite steps now, in cooperation with your state health officer, to develop plans of organization for the complete coverage, as soon as competent personnel can be obtained, of this state, with full-time cooperative local health services.

In perfecting such an organization, certain basic principles should be borne in mind:

1. Local health departments should be limited to a population group of 25,000 or more, preferably 50,000. In this state, to obtain this population, it will be necessary in many instances to combine two or more counties into a district.

2. Local financial participation must be obtained. Pride of ownership must be constantly stressed for the successful operation of local health service on the basis of that eternal verity that "Where your treasure is, there will your heart be also."

3. A sane and constructive public health program must be designed and proposed. The main items of such a program should embrace public health education, control of communicable diseases, maternal, infant and school health services, mental and adult hygiene, and a broad program of environmental sanitation. Such a program should strive to accomplish the following results: (a) See that every home in the area over which the department has supervision has a safe water supply, a safe method of excreta disposal, and is effectively screened against flies and mosquitoes. (b) Insure a safe public water and milk supply and see that the public food vending establishments comply with accepted practices of sanitary procedure. (c) So conduct the maternal and infant health program that every expectant mother has adequate prenatal, obstetric and postnatal care; that every infant has modern scientific supervision through the first year of its life; and that every preschool child has that type of supervision which will insure that, by the time school age is reached, it will be free of all correctable physical defects, and protected against those diseases for which an immunization agent is available. As this is done, school health work will assume a minor role in the general health program. (d) Arrange for the participation in the program designed to rehabilitate returning soldiers. (e) Give serious consideration to the development of a constructive mental hygiene program, with a view of reducing the incidence of neuropsychiatric conditions. (f) Provide stimulation for a program designed to ascertain what can be done to reduce the mortality rates from the degenerative diseases.

To execute such a program, it becomes at once evident that full-time, well-trained personnel will be required. Can such a program be executed? Recently, there came

to the desk of the writer a report of a county health department in one of the southern states for the year 1942. This county has a population of approximately 50,000, 77 per cent of which is colored. The budget for maintaining this department totals \$40,840, approximately 80 cents per capita. More than 50 per cent of these funds were derived from local sources. The staff consisted of one full-time physician as health officer, two inspectors, six public health nurses, one dental hygienist, one laboratory technician, two clerks, and one part-time veterinarian for meat inspection. The budget also provided an item for the payment of local physicians for services rendered in the public health program.

Any community where 77 per cent of the population is colored naturally presents formidable public health problems. What then, were the results accomplished in this county? All of the homes in every municipality in this county had been provided with a safe method of excreta disposal, either by means of water carriage systems or sanitary privies. Ninety-seven per cent of the school children of the county are provided with a safe method of excreta disposal; 81 per cent of the school children are served with a protected water supply; and 77 per cent with adequate hand-washing facilities. Eighty-nine per cent of the public milk supply in that county is pasteurized. The general death rate was 8.8, in comparison with a rate of 10.3 for the registration area of the United States. The maternal death rate and infant mortality rate, which are regarded as one of the most delicate indices of an effective public health program, are strikingly significant, particularly when it is realized that 88 per cent of all births in this county are delivered by midwives. The infant mortality rate was 35.9, and the maternal death rate was 2.9 per thousand live births. These rates are considerably lower than those of the registration area of the United States. Apparently, the health department has performed a Herculean task in teaching the midwives in that county the value of soap and water cleanliness and the dangers of needless meddling in cases of obstetrics. The achievements in this county can be duplicated anywhere in the United States, wherever there exists teamwork between the medical profession and the public health officials.

The organization and inauguration of a sane and sensible public health program on a state-wide basis is a task fraught with trials, tribulations, and terrific obstacles. Persistence, determination and intelligent leadership are essential requirements for ultimate success. To supply that leadership in this state constitutes a real challenge to the members of this association. It is hoped that the medical profession will accept this challenge and will be so persistent in its efforts that the result will be a public health organization and program of which the profession and the people of this state will be justly proud. During this organization period the crying need will be for real men, imbued with a spirit of loyalty to the best interest of scientific medicine, actuated by a determination to see that the task is effectively done in spite of all obstacles, absolutely immune to the seductive call of politics, and motivated by an insatiable desire to render efficient service to humanity.

The Problem of Deformity in Poliomyelitis

J. Albert Key, M.D.
St. Louis, Missouri

THE majority of individuals who survive an attack of acute poliomyelitis recover from the disease completely and this recovery is spontaneous. In these patients there is no residual paralysis and the stiffness subsides spontaneously and they do not require any special treatment. In the remainder the acute stage subsides, but the patient is left with a variable amount of flaccid paralysis of the voluntary muscles. Some of this paralysis is temporary and the muscles will regain part or all of their power if they are given a chance to do so, and some of it is permanent and will persist in spite of any known treatment.

In addition to the flaccid paralysis there is a variable amount of stiffness in the neck and back and certain muscles may be tender when pressed upon and painful when stretched. These tender, sensitive muscles tend to contract and may become permanently shortened unless this is prevented by appropriate treatment in the early stages of the disease.

The crippling caused by the disease is due partly to the flaccid paralysis and partly to deformities. These deformities are of three types: 1, shortening or contracture of the tender sensitive muscles; 2, deformities due to muscle imbalance and 3, deformities due to abnormal function.

The deformities due to muscle contracture occur early in the disease and, if unchecked, the involved muscles may become markedly and permanently shortened. The tendency to shorten persists as long as the muscles remain tender and sensitive. It is sometimes called muscle spasm and long has been considered a troublesome problem in the treatment of the disease. In fact, the period following the subsidence of the fever is known as the stage of tenderness and contracture. The tenderness is believed to be due to irritation of the posterior roots of the peripheral nerves and the contracture to a reflex immobilization of the part such as occurs in other painful conditions.

The tenderness and contracture of muscles is an important feature in a relatively small percentage of patients, but when noted it should be treated as early in the disease as possible. By this it is not meant that the sensitive muscles should be stretched manually several times a day, because it long has been known that injudicious handling of the patient may increase the tenderness and sensitiveness of the muscles and prolong this stage of the disease. It was for this reason that Lovett wrote that the "avoidance of meddlesome therapeutics" was the most important part of the treatment during this period.

The tenderness and contracture affect especially the muscles of the back, the hamstrings and the calf muscles (the dependent areas with the patient lying on his back). In most instances all that is necessary is to keep the patient lying on his back in a flat bed for much of the day in the physiological position with small pads under the

knees and a board at the foot of the bed to prevent foot drop. During part of the day he may be turned gently on his face and a small pillow placed under the lower legs. If spontaneous pain is troublesome it may be relieved by sedatives or by local heat, either dry or moist. The heat is used for its analgesic effect and, by relieving the pain, lessens the tendency of the muscles to contract.

If the above simple measures are not sufficient the involved extremity should be immobilized in the physiological position in a well padded splint or plaster-of-paris cast. This immobilization relieves the pain and tendency to contracture and, unless it is prolonged a great deal longer than necessary, does not damage permanently the joints or muscles of the extremity. In fact, it is still the most satisfactory and economical answer to the problem presented by the painful extremity which tends to be maintained in a position of deformity. The cast may be left in position for from two to four weeks and then bivalved and the extremity examined and if it is still tender it may be replaced, or the splint or bivalved cast may be removed daily and the joints of the extremity moved through the range which is tolerated without undue pain, but painful stretching of the muscles is avoided.

The stiffness in the neck and back subsides spontaneously if the patient is left alone and not maintained too long supine in the flat bed.

Thus it is evident that the paralyzed patient should emerge from the stage of tenderness and contracture in from three to eight (rarely more than eight) weeks with no deformities and ready to begin the attempts to restore power in the paralyzed muscles and to learn to use his muscles in the most advantageous manner.

The late deformities occur slowly over a period of years and are due partly to the pull of strong muscles which are not counteracted by their weak opponents and partly to the deformation of growing bones resulting from abnormal strains and pressure. Naturally they are most severe in the partly paralyzed extremities of young children, as their bones grow faster and have farther to go. The hands and feet are especially affected and while the deformity may be lessened and its progress delayed by suitable braces or shoes, it may not be possible to prevent it entirely by any means at our command, if he is permitted to use the extremity.

For instance, if in a small child the evertors of the foot are completely paralyzed and the invertors of the foot are strong, this child is going to develop an inversion deformity of this foot if he is permitted to walk on it, even with a correctly designed and fitted brace and shoe. It is obvious that that foot will eventually need surgery: either muscle transplants or stabilization, or both. It is my practice to use braces largely where they are necessary to permit or improve function and rarely to prevent deformity. The deformity can be corrected later by surgery and in the meantime the patient has hardened the

foot by use, its growth has approximated though not equalled the normal and he has led a relatively untrammelled existence over the intervening years.

It is obvious that the prevention and correction of the late deformities which develop during the growing period in patients who have been partially paralyzed by poliomyelitis, present individual problems which must be solved according to sound orthopedic principles. Fortunately it is rarely indeed that a patient who survives the acute attack of the disease is so paralyzed that he cannot pursue a useful existence, and in good orthopedic

practice it is almost unknown for deformities to seriously cripple a patient who would otherwise be able to carry on.

Undoubtedly deformities do occur, but they can be corrected to such a degree that they do not seriously handicap the patient. In the last analysis it is the permanent paralysis caused by the destruction of the motor nerve cells in the spinal cord which is responsible for the severe crippling which poliomyelitis occasionally causes and no treatment now known has been shown to prevent or even to lessen the extent of this permanent paralysis.

MEET OUR CONTRIBUTORS . . .

Dr. Harry O. Drew, Billings, Montana, after receiving two degrees from Creighton university, the latter in medicine in 1921, pursued his specialty, surgery, by additional study at the medical colleges of University of Nebraska, Harvard university and Minnesota. He has practiced at Billings for eight years, is the president-elect of his district medical society (Yellowstone Valley) and, in addition to state and national affiliation is a member of the Billings Clinical association.

Dr. Calvin C. Applewhite, whose medical degree was acquired at Vanderbilt university in 1913 and whose graduate activities were at Harvard university, is a member of the American Public Health association, the American Medical Association, Southern Medical association, and the Association of Military Surgeons of the United States. Previous to his transfer to District 4 of the United States Public Health service he was director of District 7 at Kansas City, Missouri.

Dr. John Albert Key, St. Louis, Missouri, graduated from Johns Hopkins University school of medicine in 1918; has practiced in St. Louis for twenty-one years his specialty of orthopedic surgery, during which time he has held the presidency of the American Orthopedic association and membership in five surgical societies as well as in the American Medical Association. He is professor of clinical orthopedic surgery at Washington University school of medicine. This is his first contribution to JOURNAL-LANCET.

Dr. Ralph I. Canuteson, president of American Student Health association and head of University of Kansas health service at Watkins Memorial hospital, Lawrence, Kansas, while modestly claiming to "lead a very ordinary and unspectacular life" is, according to a JOURNAL-LANCET representative who called on him, inordinately busy and effective as ASHA proxy and member of the executive committee of the Kansas Tuberculosis and Health association. His effectiveness in the activities of the American Trudeau society and American Public Health association is notable. Degrees—A.B. University of Wisconsin, M.D. University of Minnesota (1926); member of state and American medical associations; Sigma Xi and Alpha Omega Alpha. A sturdy and progressive partizan in the cause of public health.

Book Reviews

Your Eye! Light on Sight, by F. L. Wicks, M.D. 171 pages, including index.

The author of this useful little book is too modest to fatter it with his name. But we have been able to pierce the veil of his anonymity and can tell you that he is none other than Dr. R. L. Wicks, past president of the North Dakota State Medical association and one of the leading practicing ophthalmologists in the Northwest.

During the 25 years devoted to his specialty Dr. Wicks has collected considerable evidence on the ignorance of the average layman regarding the organ upon which most of his life's happiness depends. He has designed his book to offset this ignorance, to inspire a less casual attitude toward the care of the eye and to stimulate parents and teachers to a lively awareness of sight threats to their charges.

The book is divided into three sections: The first acquaints the reader with the eye's normal anatomy, physiology and hygiene, describes its commonest defects together with corrective measures and explains the proper use and care of glasses; the second section states and answers those questions the author has found most baffling to his patients; the third contains a series of brief miscellaneous articles dealing with related subjects, and the commoner eye diseases such as cataract, glaucoma, night and color blindness and others. Numerous diagrams graphically clarify the text.

Although the book is necessarily technical at times, and may demand a little thoughtful study from persons with no knowledge of eye structure, to those who have had school or college physiology courses it should be a welcome refresher. Its clearly expressed advice cannot fail to interest all with imperfect vision. Perhaps its greatest value lies in its warnings and practical suggestions to parents.

"Eye men" might well keep a copy of this book on their waiting-room tables and call it to the attention of their more intelligent patients.

Bronchial Asthma, by LEON UNGER, M.D. Springfield, Ill.: Charles C. Thomas, 724 pages, 126 figures, one color plate, 1945, \$9.00.

This monograph is offered to the student, general practitioner and the specialist at a time when interest in bronchial asthma has increased many fold on account of the fact that physicians are attempting more actively than ever to take proper care of any individuals with this disease. Then too, the fairly large number of cases which have appeared in the army and navy has indicated that this disease is one that should be given much consideration. The author apparently felt that his book was just the thing that the physician might need in order to be as up-to-date as possible in the handling of patients with bronchial asthma. The reader feels that it is not necessary to go back and review much that has been written on the subject of asthma. The author has done this and he has evaluated all that he has found in the literature in the light of his own personal experiences. Reading the book one feels that he is standing by as a consultant.

The monograph is divided into three parts. There is a long clinical section followed by a laboratory section and appendix. The clinical part deals with the etiology, diagnosis and treatment, the laboratory section is devoted to the technic of preparing extracts and, for diagnosis and treatment, the technic of pollen and mold counts and special procedures. The appendix gives the sources of allergens and instructions regarding diets and avoidance of house dust and other excitants. As a whole the book is more than just another publication concerning an allergic subject, and therefore is highly recommended.

Transactions of the Montana State Medical Association

Sixty-seventh Annual Session

Butte, Montana

July 14, 15, 1945

OFFICERS, 1945-1946

(Elective)

S. A. COONEY, Helena	President
J. C. SHIELDS, Butte	Past President
M. A. SHILLINGTON, Glendive	President-elect
W. H. STEPHAN, Dillon	Vice President
R. F. PETERSON, Butte	Secretary-Treasurer
J. H. IRWIN, Great Falls	Delegate to A.M.A.
E. M. GANS, Harlowton	Alternate Delegate to A.M.A.

EXECUTIVE COMMITTEE

S. A. COONEY	Helena
M. A. SHILLINGTON	Glendive
J. C. SHIELDS	Butte
B. R. TARBOX	Forsyth
R. F. PETERSON	Butte

COUNCILORS

District No. 1	R. D. KNAPP, Wolf Point	1946
District No. 2	CHARLES HOUTZ, Havre	1946
District No. 3	J. H. GARBERTON, Miles City	1948
District No. 4	T. R. VYE, Laurel	1948
District No. 5	R. G. SCHERER, Bozeman	1947
District No. 6	R. G. JOHNSON, Harlowton	1948
District No. 7	F. B. ROSS, Kalispell	1946
District No. 8	J. H. IRWIN, Great Falls	1948
District No. 9	H. W. GREGG, Butte	1947
District No. 10	A. C. KNIGHT, Philipsburg	1946
District No. 11	D. T. BERG, Helena	1947
District No. 12	A. R. FOSS, Missoula	1947

APPOINTED COMMITTEES

(Committee appointments are all for one year, unless otherwise designated)

LEGISLATIVE COMMITTEE

S. A. COONEY (chairman)	Helena
J. M. FLINN	Helena
D. T. BERG	Helena
O. G. KLEIN	Helena
R. C. MONAHAN	Butte
E. D. HITCHCOCK	Great Falls
H. M. BLEGEN	Missoula
R. R. SIGLER	Bozeman

HOSPITAL COMMITTEE

R. W. MORRIS (chairman), Helena	1946
R. L. TOWNE, Kalispell	1948
I. J. BRIDENSTINE, Miles City	1947

PUBLIC INSTRUCTION AND HEALTH COMMITTEE

AND PUBLIC RELATIONS COMMITTEE

M. A. SHILLINGTON (chairman)	Glendive
L. W. BREWER	Missoula
R. E. SEITZ	Bozeman

CANCER COMMITTEE

H. J. GARBERTON (chairman)	Miles City
H. H. JAMES	Butte
J. H. BRIDENBAUGH	Billings
J. M. NELSON	Missoula

Great Falls

HISTORY OF MEDICINE COMMITTEE

E. D. HITCHCOCK (chairman)	Great Falls
F. F. ATTIX	Lewistown
J. H. IRWIN	Great Falls

ORTHOPEDIC COMMITTEE

L. W. ALLARD (chairman)	Billings
G. W. SETZER	Malta
J. K. COLMAN	Butte
R. B. RICHARDSON	Great Falls
W. E. LONG	Anaconda

DENTISTS, PHARMACISTS AND NURSES COMMITTEE	
B. K. KILBOURNE (chairman)	Helena
B. R. TARBOX	Forsyth
W. H. STEPHAN	Dillon

PROGRAM COMMITTEE	
M. A. SHILLINGTON (chairman)	Glendive
T. F. WALKER	Great Falls

MEDICAL INSURANCE AND LEGAL AFFAIRS COMMITTEE	
P. E. KANE (chairman)	Butte
J. C. MACGREGOR	Great Falls
G. A. JESTRAB	Havre
F. B. ROSS	Kalispell
J. H. BRIDENBAUGH	Billings
E. R. GRIGG	Bozeman
A. T. HAAS	Missoula

MEDICAL PUBLICATIONS COMMITTEE	
A. R. FOSS (chairman)	Missoula
A. J. KARSTED	Butte
H. J. HALL	Missoula

MEDICAL ECONOMICS COMMITTEE	
H. J. GARBERTON (chairman)	Miles City
M. A. SHILLINGTON	Glendive
R. B. DURNIN	Great Falls
H. T. CARAWAY	Billings
F. F. ATTIX	Lewistown

POSTGRADUATE COMMITTEE	
F. R. SCHEMM (chairman)	Great Falls
S. V. WILKING	Butte
A. R. KINTNER	Missoula

FRACTURES COMMITTEE	
S. L. ODGERS (chairman)	Butte
T. B. MOORE, Jr.	Kalispell
I. A. ALLRED	Great Falls
H. J. HALL	Missoula
V. O. UNGHERINI	Butte

TUBERCULOSIS COMMITTEE	
F. I. TERRILL (chairman)	Galena
E. M. LARSON	Great Falls
J. L. MONDLOCH	Butte
W. GORDON	Billings
R. G. KEETON	Bozeman

ADVISORY BOARD WOMEN'S AUXILIARY	
J. P. RITCHIEY (chairman)	Missoula
E. D. HITCHCOCK	Great Falls
E. S. McMAHON	Butte
C. H. NELSON	Billings
D. T. BERG	Helena

INDUSTRIAL HYGIENE COMMITTEE	
A. T. HAAS (chairman)	Missoula
HAROLD SCHWARTZ	Butte
J. B. FRISBEE	Butte
L. M. FARNER	Helena

MEDICAL MILITARY PREPAREDNESS AND DEFENSE ACTIVITY COMMITTEE	
E. H. LINDSTROM (chairman)	Helena
R. V. MORLEDGE	Billings
W. A. LACEY	Havre
F. L. UNMACK	Deer Lodge
F. L. ANDREWS	Great Falls

ROCKY MOUNTAIN CONFERENCE COMMITTEE	
H. W. GREGG (chairman), Butte	1948
R. W. MORRIS, Helena	1949
C. H. NELSON, Billings	1946
J. R. SOLTERO, Billings	1947
T. F. WALKER, Great Falls	1950

NOMINATING COMMITTEE

A. R. FOSS (chairman)	Missoula
E. M. GANS	Harlowton
L. G. DUNLAP	Anaconda

MATERNAL AND CHILD WELFARE COMMITTEE

F. L. MCPHAIL (chairman), Great Falls	1947
D. L. GILLESPIE (vice chairman), Butte	1947
J. DIMON, Polson	1946
T. L. HAWKINS, Helena	1947
L. W. BREWER, Missoula	1946
P. L. ENEBOE, Bozeman	1946
E. A. HAGMANN, Billings	1947
R. L. TOWNE, Kalispell	1947
E. L. GALLIVAN, Helena	1946
A. L. GLEASON, Great Falls	1946
B. C. FARRAND, Jordan	1946
E. A. WELDEN, Lewistown	1946
MAUDE M. GERDES, Billings	1950
S. N. PRESTON, Missoula	1946

STATE INSTITUTIONS

W. E. LONG (chairman)	Anaconda
H. W. GREGG	Butte
J. I. WERNHAM	Billings

REHABILITATION COMMITTEE

H. J. McGREGOR (chairman)	Great Falls
F. P. NASH	Townsend
JAMES McCABE	Helena
E. M. GANS	Harlowton
J. E. GARVEY	Butte

RURAL MEDICAL SERVICE COMMITTEE

F. F. ATTIX (chairman)	Livingston
F. E. KEENAN	Great Falls
J. W. CRAIG	Circle
B. R. TARBOX	Forsyth
R. B. FARNSWORTH	Virginia City

REVISION OF THE CONSTITUTION COMMITTEE

M. G. DANSKIN (chairman)	Glendive
F. D. HURD	Great Falls
R. M. MORGAN	Helena

ANNUAL MEETING OF THE COUNCIL OF THE MONTANA STATE MEDICAL ASSOCIATION

First Session, 9 A.M., Saturday, July 14
at the Placer Hotel

Present were J. H. Garberson, Miles City, L. W. Allard, Billings, J. H. Irwin, Great Falls, H. W. Gregg, Butte, A. C. Knight, Philipsburg, D. T. Berg, Helena, A. R. Foss, Missoula, J. C. Shields, president, R. F. Peterson, secretary-treasurer. Dr. J. H. Irwin was elected chairman; Dr. R. F. Peterson, secretary. Dr. J. H. Irwin appointed Dr. D. T. Berg, Dr. A. C. Knight, Dr. A. R. Foss as an auditing committee. The report as signed by the above three members is as follows:

"We, as members of the finance-auditing committee of the council have inspected the audit and found it to be in order."

It was moved by Dr. Gregg and seconded by Dr. Berg that the minutes of the last meeting of the council as published in the JOURNAL-LANCET be accepted as read. Unanimously approved.

A letter from the JOURNAL-LANCET to the secretary was read, and the letter was referred on motion of Dr. Gregg and seconded by Dr. Knight to Dr. A. R. Foss, chairman of the publications committee, giving him power to act with the suggestions therein recorded as to the editorial board and the submission of scientific papers from Montana.

Dr. A. R. Foss of Missoula moved that the following motion from the Western Montana Medical society be approved:

"We are unanimously opposed to the continuation of the E.M.I.C. program after the war." Passed unanimously.

It was moved by Dr. Gregg and seconded by Dr. Berg that Mr. E. G. Toomey of Helena be retained as counsel for the Montana State Medical association for the ensuing year at \$300.00 per year.

The council was then adjourned, subject to call.

PROCEEDINGS

of the
HOUSE OF DELEGATES
SIXTY-SEVENTH ANNUAL MEETING

of the

MONTANA STATE MEDICAL ASSOCIATION

10 A.M., Saturday, July 14, 1945

The Hotel Placer, Helena, Montana

The session was called to order by the president, Dr. J. C. Shields. The following delegates presented credentials and were seated during the two-day session: Cascade county—Drs. Thomas Walker, J. H. Irwin, R. B. Durnin, H. J. McGregor, F. D. Hurd, E. D. Hitchcock; Chouteau—None; Fergus—Drs. R. G. Johnson, F. F. Attix; Flathead—Dr. Edith Boyd; Gallatin—None; Hill—Drs. F. W. Aubin, Chester Lawson; Lake—None; Lewis & Clark—Drs. W. F. Cashmore, D. T. Berg; Madison—Dr. R. B. Farnsworth; Mt. Powell—Drs. A. C. Knight, F. J. Terrill; Musselshell—None; Northcentral—None; Northeastern—None; Park-Sweetgrass—None; Silver Bow—Drs. W. H. Stephan, D. A. Atkins, P. T. Spurck, S. V. Wilking, H. W. Gregg; Southeastern—Drs. B. R. Tarbox, M. G. Danskin, B. C. Farrand; Western—Drs. L. W. Brewer, H. M. Blegen, A. R. Foss, C. L. Farabaugh, J. P. Ritchey; Yellowstone—Drs. L. W. Allard, T. R. Vye, H. T. Caraway.

The president, Dr. J. C. Shields, opened the session with the following statement: "This is the sixty-seventh annual meeting of the Montana State Medical association. At this annual meeting, for the first time in our history, there will be no scientific session. These two days, July 14th and 15th, 1945, will be devoted to the business of the association. The two important subjects at this session will be public relations and the report of the economic committee on voluntary prepaid medicine. At the banquet this evening, which will be at 7 o'clock at the Montana Club, I will give a short talk."

Dr. A. C. Knight of Philipsburg was requested to preside over the house while the president attended to other business.

Dr. J. H. Irwin moved that the minutes of the sixty-sixth annual session held in Butte, Montana, July 13 and 14, 1944, be accepted as published in the JOURNAL-LANCET of October, 1944. This was seconded by Dr. B. C. Farrand and unanimously passed.

Upon returning to the chair, Dr. Shields appointed as the necrology committee the following: Dr. F. D. Hurd, chairman; Dr. H. W. Gregg, Dr. A. R. Foss. To serve on the resolutions committee he appointed the following: Dr. L. W. Brewer, chairman; Dr. Thomas Walker, Dr. R. G. Johnson.

The report of the secretary was then received.

SECRETARY'S REPORT TO THE HOUSE
OF DELEGATES

The Association membership is as follows:

	1945	1944	1940
Total	430	444	408
Life and Honorary	8	7	—
Military	114	107	—
Dues-paying	308	330	408

An important fact in this chart which must be considered by the house of delegates is that in 1940 there were 408 dues-paying members, whereas in 1945 this has dropped an even 100 to 308. Up to July 15, 65 of these dues-paying had not remitted, so that by the end of 1945 it is possible that this part of our membership may drop below 300. A further breakdown of the dues-paying members is as follows:

Retired and inactive	20
Semi-retired	13
Government and Board of Health	5
Practicing in other states	2
Active private practice	268

Total 308

There are in Montana at least 36 doctors who are not members of the state association. Of these, 24 are in active practice and 12 are retired. Of the 24 who are in active practice, 7 are in the Indian services or the Veterans services. However, it is the duty and obligation of the councilors and local medical societies to see that as many as possible of these men become members of the local and state associations.

The activities of the secretary's office were unusually heavy the past year due mainly to the following reasons:

- 1) The campaign against Initiative No. 48,
- 2) A large number of national legislative issues,
- 3) Intensive acceleration in public relations activities,
- 4) Prepayment medical plans, both local and national.

Your association is far behind most other states in these activities and must attempt to catch up.

Your secretary traveled between 8,000 and 9,000 miles during the year on association business, and about 2500 letters were mailed from the office. These figures are given because it is felt that to have done the kind of job that the association deserves, these figures would at least have to be doubled.

The minutes of the secretaries' meeting that was held in Chicago in November, 1944, and which was attended by the secretary, were given in full in the *Journal of the American Medical Association* for your inspection.

In March, 1945, a meeting of the United Public Health league was attended in Salt Lake City. Your secretary herewith brings to you an invitation from that organization that the Montana State Medical association become a member of that organization.

For the defeat of Initiative 48, the membership displayed real solidarity—259 association members paying assessments besides 4 non-members and 5 members in the services.

R. F. PETERSON, M.D., Secretary.

It was moved by Dr. Walker and seconded by Dr. Hurd that the secretary's report be accepted and made a part of the minutes. The motion passed unanimously.

Dr. Hurd made a motion that the House of Delegates of the Montana State Medical association go on record as supporting and approving the United Public Health league and allow individual solicitation of dues from its members. This motion was seconded by Dr. Caraway and passed unanimously.

Report of Finance Auditing Committee

The following report was presented by Dr. J. H. Irwin:

"We, as members of the finance auditing committee of the council, have inspected the audit and found it to be in order."

D. T. BERG, M.D.
A. C. KNIGHT, M.D.
A. R. FOSS, M.D.

REPORTS OF STANDING COMMITTEES

Publications Committee

Dr. R. F. Peterson, secretary-treasurer of the Montana State Medical association, has a letter from the JOURNAL-LANCET, in which they state that there have been very few papers from Montana during the past few years. We have not taken the interest in our publication that we should have, and the JOURNAL-LANCET wants us to take more interest in this in the future.

In the first place, they would like to have each county society send in the papers which are read at their local meetings. This would help a great deal, as most papers are read and then put away, and forgotten about. In that way, much valuable time of our doctors is taken and lost, after it is once read at the session.

During the coming year, the JOURNAL-LANCET would like to revise the official editorial board, and has called on Montana to revise their board of the JOURNAL-LANCET. Your committee is going to do that some time soon.

We feel that the JOURNAL-LANCET is a good publication, and are doing their best to serve us. Our contract with the journal does not expire this year.

A. R. Foss, M.D., Chairman.

Committee on Public Instruction and Health and Public Relations Committee

This committee, as a whole, has had no meetings. The chairman has been giving some consideration to the matter of public relations. Apparently public relations is the most important subject before the doctors at the present time. We are faced with the threat of being employed by the government instead of working for ourselves. It is upon the general public that we will have to depend for an opinion to counteract this movement.

Public relations are carried on in a number of various ways:
1) The general attitude and deportment of the doctor in his office. 2) The use of radio programs by commercial companies which are purveyors to the doctors, such as the program of

Lederle Laboratories, called "The Doctors Talk It Over." 3) The use of public health leagues which are being established by many states. 4) The use of radio and newspapers by the medical societies as mediums for direct contact.

The chairman of your committee has the following to say about these: 2) Lederle Laboratories has granted us permission to have a medical society tie-in with their program on all four stations in Montana. 3) The Public Health League in Montana is alive and growing and an active concern. It is very essential that this house of delegates go on record as approving the work of the Public Health league and make some definite recommendations to the Montana State Medical association for financing their activities. 4) The use of newspapers and radio by the doctors themselves does not seem to be a logical choice at this time. First of all, the cost of these services is very great. The radio programs must be artistically prepared and artistically presented to be at all effective. It has been the experience, particularly in New York state where this work has been done successfully, that it takes an active staff to prepare, edit, and rehearse the programs for each week. This we cannot do in Montana. The Southeastern Montana Medical society has carried a program on the Miles City station for several months. We have been unable to get a survey to see whether or not this is of value, but I doubt it. The osteopaths have been putting on a program on some of the Montana stations which is very grandiose and very misleading in its statements to the public. Their program savors of the Indian medicine-show type of advertising. Such a thing must definitely be avoided by the medical profession.

In conclusion I have the following recommendation to make: that the president of the association appoint a committee consisting of five members, strategically placed geographically in the state, to handle the matter of public relations and to represent the medical profession to the Montana Public Health league, to aid in securing funds from the physicians to support the League, and to approve any public propaganda the Public Health league might put out relating to the medical profession.

M. A. SHILLINGTON, M.D., Chairman

Dr. Attix moved that the house of delegates elect a member to act as a director to the Public Health League of Montana and to be chairman of the committee on public relations and that the executive committee appoint four additional members to this committee. Dr. J. H. Irwin seconded the motion. After a discussion it was moved by Dr. Hurd and seconded by Dr. Cashmore to table the motion. A standing vote revealed 19 for tabling the motion and 5 against. It was then moved, seconded, and passed that the president appoint a committee of five to study the matter of how the Montana State Medical association will be represented in the Montana Public Health league and to bring in a recommendation this afternoon. The following committee was appointed: Drs. J. H. Garberson, H. J. McGregor, F. F. Attix, M. A. Shillington, D. T. Berg.

Mr. D. W. Bowler, manager of the Montana Public Health league, and Mr. Frank Hazelbaker, field representative, gave a report of the activities of the Public Health league and sketched an outline of their future proposed activities.

The meeting was then adjourned for lunch, and on reconvening at 2 P.M. Dr. Garberson presented the following report of the proposal committee that was appointed in the morning:

Your committee recommends the appointment of the public relations committee, of the Montana State Medical association, by the president, in accordance with the by-laws.

The committee further recommends that the work of the Public Health League of Montana be commended, and that the Montana Medical association cooperate with said Public Health league.

We further recommend that the house of delegates elect one representative to serve on the board of directors of the Public Health League of Montana; and we further recommend that the Public Relations committee of the Medical Association of Montana shall act in an advisory capacity to said representative.

J. H. GARBERSON, M.D., Chairman
H. J. MCGREGOR, M.D.
F. F. ATTIX, M.D.
M. A. SHILLINGTON, M.D.
D. T. BERG, M.D.

Report of Cancer Committee

Owing to conditions, your Cancer committee has done little during the past year, excepting to lend its cooperation to the Women's Auxiliary of the American Cancer society.

This society has, we feel, done a splendid piece of work in Montana. During their recent drive, they collected \$39,000.00 in the state, thereby leading all of the states in the union.

A great deal of this success is due to the enthusiasm and untiring energy of Mrs. Anna Peterson, and we feel that her efforts and the efforts of the other ladies in this society should be formally recognized by the Medical Association of Montana.

It is recognized by this committee that much work should be done in the way of educating not only the public but the doctors in the early recognition of cancer. However, as was the case one year ago, we still feel that little of this can be done until the war emergency is over, and until the normal complement of physicians has returned to the state of Montana. But we feel that when that condition does obtain, a definite program should be entered into by this association in cooperation with the American Cancer Society, looking both towards further education of the public and further training of the practitioners of Montana in the early recognition of cancer.

J. H. GARBERTON, M.D., Chairman

Dr. Berg made a motion that Mrs. Anna Peterson be made an honorary member of the Montana State Medical association for her outstanding and unselfish work in cancer prevention and public health in the state of Montana. Dr. Irwin seconded the motion and it passed unanimously. A suitable plaque was provided with the following inscription, to be presented at the banquet to Mrs. Peterson:

THE MONTANA STATE MEDICAL ASSOCIATION

To All to Whom These Presents Shall Come, Greeting:
Be It Known, That by virtue of authority vested in them
the Delegates of the Montana State Medical Association
do hereby confer upon

MRS. ANNA PETERSON
AN HONORARY MEMBERSHIP
in the

MONTANA STATE MEDICAL ASSOCIATION

These letters being their testimonial of the unselfish devotion
and outstanding accomplishments of the

Officers and Members of
THE MONTANA DIVISION,
AMERICAN CANCER SOCIETY
in the field of

CANCER PREVENTION AND PUBLIC HEALTH.
Given this fourteenth day of July,
nineteen hundred and forty-five.

J. C. Shields, M.D., President

R. F. Peterson, M.D., Secretary

Annual Banquet, July 14

Dr. R. W. Morris was toastmaster at the banquet. Col. C. H. Fredrickson, M.C., of Missoula, recently returned on leave from the southwest Pacific, was the main speaker of the evening. He gave an excellent and interesting discussion on his war experiences.

At the banquet Dr. J. C. Shields, as president, presented the plaque to Mrs. Peterson with the following statement:

CHRISTIAN CHARITY: An Address

"The world today is more in need of charity—love of our fellow man—than at any other period of history, unless it be the fall of the Roman empire.

In college I had an old professor of Latin. Besides being a good Latin scholar, he was something of a philosopher. His philosophic definition of charity, the love of fellow man, was this: 'Love is that attribute of a rational being by which he gives himself and asks nothing in return.' This, ladies and gentlemen, is true Christian charity, to give one's self, one's skill, talent and time for the welfare of humanity, asking nothing in return. The virtue of charity, I think, more than any other Christian attribute, marks the difference between the pagan and the Christian world.

In order to emphasize and fix an idea or definition in our young minds, the old Latin professor employed history, story and legend. Likewise, on this occasion he gave us the following history and legend. Some fifty miles west of Rome, as the traveler ascends the course of the Anio river, he comes to an

open space or basin, surrounded by immense walls of perpendicular rocky cliffs. From above, the waters of the Anio, plunging from fall to fall, cut a deep, narrow gorge in the western foothills of the Apennine mountains. This place is called Subiaco.

The emperor Nero perceived the grandeur of the place. He dammed the waters of the Anio, making an artificial lake with baths below and erected a beautiful villa. Here during the hot Italian summers, Nero and his court gathered for celebrations and feast. One night while Nero sat at the table a crash of thunder shattered a cup of wine as he held it to his lips. His miserable soul was filled with horror, and considering it a bad omen he deserted the place.

Centuries passed. Underbrush, briars and giant trees of the forest grew in the gardens, and the villa became the lair of wild beasts. Four hundred years after Nero, when solitude and silence had long replaced the imperial orgies, a young patrician, fleeing from the delights and dangers of Rome, sought there a refuge in which to study, pray and contemplate. He was baptized Benedictus, meaning, 'well said' or 'blessed'. A scion of the lords of Nursia, he deserted honor, fortune and happiness to give himself for his fellow man, asking nothing in return. He was followed by only a male nurse as he plunged into this wild gorge, ascending an almost inaccessible hill on the site of which he discovered a cavern that overlooked the Anio.

His old nurse supplied him with food by means of a rope on which hung a bell to notify Benedict of the arrival of his daily bread. Here Benedict lived in solitude, prayer and study for three years. His reputation for wisdom, learning and charity spread throughout the countryside. In a few years this anchorite of Subiaco was directing several monasteries, but now Benedict pointed his steps southward along the western slopes of the Apennines. He came to a large flat basin, in the center of which rises a rocky, precipitous mountain with rounded, flattened top, known as Monte Cassino.

At the foot of this mountain were the ruins of an ancient town called Cassinum, and somewhat above an amphitheater which dates from the time of the caesars. The place had been famous for generations because of the writings of that noble old pagan, Varro, whom the disciples of Benedict honored and revered.

From the summit, the birthplace of the prince of Roman orators could be seen in the distance, and the landscape extended to the southwest in an undulating plain to form the shores of the Mediterranean. To the northeast the rugged valleys and canyons were lost in the skyline of the Apennines. Centuries later, Dante in his 'Paradise' sings of St. Benedict and the grandeur of Mount Cassino.

On the summit of the mountain were two temples to Apollo. Although Rome had been Christian for over two centuries, the inhabitants were pagans. Benedict reconverted the pagans, and with the aid of his disciples he changed the temples of Apollo into chapels and established the most famous monastery in all of Christendom, Monte Cassino.

This famous monastery was first destroyed by the Lombards in the sixth century; it was rebuilt in the eighth; destroyed by the Saracens in the ninth, later restored, again despoiled by Napoleon, and finally reconstructed to much of its ancient grandeur during the nineteenth century. During the present war as our boys advanced over the rolling plains from the shores of the Mediterranean, the Germans used the monastery of Mount Cassino as a lookout. The monastery was again destroyed by our own air forces. Let us hope that through America's generosity, it will be restored, as the University of Louvain was following the first World war.

Clergy and layman, peasant and nobleman, barbarian and pagan flocked to Benedict. His disciples went forth to all the barbarian tribes of Europe—Goths, Visigoths, Vandals, Teutons, Gauls and Franks—to christianize, civilize and educate in the arts of peace, to copy and preserve the literature and the culture of the ancient world, to found the monastery with its hospice where the weary traveler might be refreshed, the beggar fed, the ill nursed to health, and solace given to the leper. St. Benedict and his disciples gave themselves for humanity, asking no reward.

We of America, descendants of every race of western Christendom, inherit this virtue of Christian charity in our language,

our literature, our art, this giving of one's self, asking nothing in return. It is this of which Lord Tennyson sings in 'Sir Galahad'; of which our own poet, Lowell, breathes forth in the 'Vision of Sir Launfal.' It is that which the artist, Murillo, depicts in that rare old painting, 'The Children of the Shell,'—where an injured child kneels heavily, resting against his staff, while a second child gives drink from a broken shell. Faintly in the clouds can be seen *Ecce Agnus Dei*, Behold the Lamb of God.

It is well for the future world that America is so blessed with that noble virtue, Christian charity, while unfortunate Europe writhes in agony from neo-paganism.

As president of the Montana State Medical association, it is my pleasure and privilege to pay tribute to that galaxy of loyal Montana women who exemplify that noble virtue—Christian charity—the giving of their time, their talent, their labor in the field of cancer prevention and public health, asking nothing in return.

The house of delegates, by virtue of the authority vested in them, have conferred upon you, Mrs. Anna Peterson, state commander of the Women's Field Army, an honorary membership in the Montana State Medical association.

This plaque, which I now present to you, is our testimonial of the unselfish devotion and outstanding accomplishments in the field of cancer prevention and public health, of the officers and members of the Montana division of the American Cancer society."

Orthopedic Committee

Dr. L. W. Allard, Chairman

Committee on Dentists, Nurses and Pharmacists

DENTISTS: The number of dentists practicing in the state ordinarily is approximately 300. Sixty-one dentists have been inducted into the services, and only two or three have returned to the state after separation from service. The need for additional dentists is becoming acute within the state. The state dental association reports that the prospect for additional dentists is very slight.

PHARMACISTS: The total number of registrants in good standing in the state is 644, but the total practicing within the state at the present time is 283. There are 222 registered pharmacies in the state at the present time. One hundred and one pharmacists have been inducted into the armed forces; three have been killed in action, three have been discharged, and one is a prisoner of Japan.

NURSES: The number of nurses registered in Montana in 1945 is approximately 700. Two hundred and forty new students completed training and passed the examination for registered nurses. From January 1, 1944, through December 30, 1944, 83 nurses were assigned to military service from Montana. From January 1, 1945, through June 1, 1945, 87 nurses were assigned to the military forces from Montana. The nursing association reports that the quota for nurses from Montana has always been exceeded. Owing to the large number in the armed forces, most of the hospitals are operating on a limited personnel and are employing large numbers of nurses' aides to do the work formerly done by registered nurses.

B. K. KILBOURNE, M.D., Chairman

Committee on History of Medicine

Dr. E. D. Hitchcock, Chairman

It was reported that there has been no activity in the past year by this committee and that the material that has so far been compiled is on file and in a vault in Great Falls to which this committee has access. It was moved by Dr. Durnin and seconded by Dr. Danskin that the historical committee be enlarged, that it resume work, and also to involve each local society in the work of keeping all local medical history up to date. This was passed unanimously. Dr. Allard moved that not more than \$300 be appropriated for stenographic expense to continue the medical history of Montana. Dr. L. W. Brewer seconded the motion and it was passed unanimously.

Program Committee

Dr. T. F. Walker, Chairman

As there was no scientific program at this session, this committee had no special duties.

Advisory Board on Women's Auxiliary

July 14, 1945

The advisory committee to the Women's Auxiliary to the State Medical association held a meeting today. It approved the

purpose of the Auxiliary to undertake some project, such as, for instance, the subject of food inspection, for the coming year. It sought to clarify the relationship existing between the Auxiliary and the State Medical association. It suggested the practicability of certain alterations in the constitution and by-laws of the state Auxiliary in the interest of facilitating the conduct of its proceedings and its business.

Your committee takes this opportunity to commend to your consideration, your appreciation and your gratitude, the extremely valuable cooperation and accomplishments of the Auxiliary on behalf of the best interests of the State Medical association.

J. P. RITCHIEY, M.D., Chairman
Rehabilitation Committee
Dr. F. F. Attix, Chairman

Legislative Committee
Dr. S. A. Cooney, Chairman

Your Committee on Legislation, by and through the chairman, undersigned, hereby makes report as to the subject of legislation in which the association was interested during the 29th legislative assembly of Montana, held at Helena, commencing January 1, 1945, and ending March 1, 1945.

I. *With reference to legislative proposals which were enacted into law:*

HOUSE BILL 42: (Chapter 20, Laws 1945): This bill authorizes and directs the state board of health to obtain blood from donors, to purchase equipment necessary to process such blood, and to furnish blood and plasma free of charge to the people of the state. The sum of \$20,000 is appropriated for purchase of equipment in payment of expenses. It is doubtful whether the measure will constitute a real improvement over the existing practice in the principal hospitals of the state, the larger clinics, etc., to provide blood plasma, etc. However, if the measure does any good, its existence is probably justified, and its passage surely illustrates that popular causes are not readily impeded by practical considerations.

HOUSE BILL 148: (Chapter 170, Laws 1945): This bill establishes in the state board of health a division of tuberculosis control and appropriates therefor \$25,000 for each of the next two fiscal years. The measure should prove of real utility in centering the administration of tubercular control, in giving some measure of coercion as well as persuasion in the field, and in affording a foundation for greater activity in the light of experience.

HOUSE BILL 163: (Chapter 171, Laws 1945): This is the measure which provides for full-time local health boards, or combinations of cities and counties, or counties. For the first time in Montana, there really exists a legal foundation for the activities of such boards, and the cooperative nature of the administration ought, when professional help is available, result in marked improvement in the administration of public health laws in every area of Montana.

HOUSE BILL 189: (Chapter 119, Laws 1945): This measure provides for pre-natal examination of pregnant women with reference to existence of syphilis, etc. It is one of the most advanced health measures ever adopted by the state of Montana, and should prove useful in the early discovery of syphilis during pregnancy with consequent application of controls, etc., before, on and after birth. Perhaps, having submitted this measure, a subsequent legislative assembly will actually enact the pre-marital test, into law. But, in view of experience, this latter statement is pure surmise.

HOUSE BILL 325: (now found at pages 579-606, 1945 Session Laws): is the general appropriations bill for the operation, maintenance and other purposes of state department, boards, bureaus and commissions. Among other boards affected, was the state board of vocational training and rehabilitation, and its activity of civilian rehabilitation under "Bureau of Civilian Rehabilitation." This bureau and the state board called upon the undersigned at a time when it appeared that no appropriation would be forthcoming for the work of the bureau. At the very close of the session, the bill was in the senate committee on finance and claims, with no appropriation having been made, when Mr. Leif Fredericks enlisted the aid of the undersigned, who responded by repeated appearances before the senate committee on finance and claims. The bill was amended, with the result that the 1945 session appropriated \$70,000 to the bureau

for the biennium 1945-1947. (Page 581 and page 594, 1945 Session Laws.)

The Association's interest in this work has been somewhat slow in developing due, no doubt, to lack of information as to the extensive expansion of the rehabilitation program in consequence of laws passed by congress in 1943. For this reason, it may serve a useful purpose summarily to review the matter in this report, as follows:

The original law (Public 236) was enacted by congress and approved by the president, June 2, 1920, hence the foundation has been in existence for 25 years.

The law provided for the vocational rehabilitation of disabled persons and their return to civil employment. A disabled person was defined to mean "any person who, by reason of a physical defect or infirmity, whether congenital or acquired by accident or disease is, or may be expected to be, totally or partially incapacitated for remunerative employment." The law also provided for the administration of the program by state boards of education, and the equal matching of funds by the federal and state governments. Benefits under the act were limited to training, but made possible, under certain circumstances, the purchase of artificial appliances. An acceptance act by Montana was passed by the Montana state legislature in 1921.

This basic law was amended in 1924 and again in 1932, but its provisions remained substantially the same.

However, Public Law 113 passed by Congress and signed by the president on July 6, 1943, greatly expanded the rehabilitation program and provided, in addition to benefits under original act, for the following services:

- 1) Physical restoration, including corrective surgery, hospitalization, and nursing care.
- 2) Any prosthetic device or appliance essential to obtaining or retaining employment.
- 3) Maintenance support of clients receiving training or other service.
- 4) Necessary transportation and occupational licenses.

The 1943 law also provided for the rehabilitation of war-disabled civilians, members of the merchant marine, and war veterans with non-service-connected disabilities.

The physical restoration feature of the new law became effective in Montana in January, 1945, with the appointment of Dr. S. A. Cooney of Helena as medical consultant to the Montana bureau of civilian rehabilitation and Glenn Lockwood to the position of physical restoration supervisor.

The new legislation was brought to the attention of the Montana State Medical association at its meeting in Butte last July by Mr. Leif Fredericks and its principles formally approved by the association. At the request of Mr. Fredericks, Dr. Shields, the president, appointed a number of physicians to serve on our professional advisory committee. These are:

Dr. Attix of Lewistown, chairman; Dr. Durnin of Great Falls, Dr. Colman of Butte, Dr. Morgan of Helena, Dr. Terrell of Galen.

To these men the bureau added Dr. Kilbourne of Helena, Milo Dean of Great Falls, representing hospital administration, and Miss Anna Beckwith of Helena, representing the nursing profession. The committee has already held three meetings in 1945. General policies, including the establishment of appropriate standards, the selection of facilities, and the rates of remuneration for services are determined by the committee.

In his report of activities to the association, Mr. Fredericks said: "Our medical consultant, Dr. Cooney, is the final judge in all cases that come to us for physical restoration services. No case is accepted without his approval."

Administrative expenses of the bureau are paid 100 per cent by the federal government, which matches, 50-50, costs of actual services to individuals. The last legislature appropriated \$70,000 to the bureau for the next biennium, which gives us a total of \$140,000 for rehabilitation purposes, exclusive of administration. Dr. Cooney appeared with me before the finance and claims committee of the senate, and his work and statements helped materially in securing so large an appropriation."

The remarks of Mr. Fredericks with respect to any aid from the undersigned, are not incorporated herein from any motive of self-praise, but they are incorporated herein to drive home to the members of the association the necessity of closely following any and all legislation in which the association may be

interested in passing, or, on the other hand, in defeating, and to show that, contrary to the opinion of many of the half-hearted, the assembly has respect for the opinions of the medical profession, wants to hear such opinions and will generally act responsively to them when they are fully presented, without rancor or the injection of collateral matters.

There is a restrictive feature in connection with the actual administration of the federal statute and, necessarily, state activities, to the extent that they are controlled by the federal statute which deserves notice and, in the judgment of the undersigned, should be removed. The restriction lies in the fact that the bureau of vocational rehabilitation, within the social security administration, which bureau cooperates with the Montana bureau of civilian rehabilitation, lays down rules and regulations to the effect that only those doctors of medicine can participate in the program who are affiliated with 1) the American College of Surgeons, or who are 2) diplomats, under one or the other of the recognized heads of that term. These regulations have the immediate effect of depriving most Montana doctors of medicine, certainly all who do not come within the restricted claims named, of any place or function under the program. The army and the navy have seen fit to call on these men, in large numbers, to take care of the cream of the nation, and it is a strange thing that they are not, in the eyes of the federal bureau mentioned, sufficiently equipped to participate in this program. The fault, if any, does not lie with the individual doctor; it stems from the medical colleges and schools and reflects on their training and instruction. Every day doctors of medicine in Montana are caring for persons who are not under the program, but whose disabilities are identical with those who are under the program, and yet they are restrained, notwithstanding their experience, from handling the less numerous class. This insidious discrimination should be removed, and it is recommended that the Montana State Medical association take steps in aid of such removal.

II. With respect to measures which failed of passage:

The only measure in which you would probably be interested was H. B. 95, a new uniform nurses practice act, which passed both houses of the legislative assembly but was vetoed by the governor because he thought it would "eliminate the practical nurse," notwithstanding the presence of a waiver section which left practically anyone "in" for the next three years, and after that established reasonable requirements for their admission to the status of licensed attendants. It is probably true that there was considerable basic opposition from rural areas, and small towns, which are now almost bereft of any kind of nursing service. It probably is also true, and on this our counsel expresses definite conviction, that the governor was influenced by osteopaths and chiropractors who are always antagonistic to any legislation which has the backing of a medical fraternity. They insisted on their "office attendants" and servants being wholly exempt from the act, and were granted this concession in the bill, but it is thought they continued their opposition in the governor's office after they found the legislative assembly agreeable to passage.

S. A. COONEY, Chairman Medical Economics Committee

Your economics committee has done considerable work during the current year. It has held three meetings, besides numerous conferences, etc., one meeting at Billings and two at Helena. In this connection, we think it is no more than just that recognition be given to the outstanding work, energy and time which have been devoted to these matters by Drs. Shillington and Caraway.

Of paramount importance at this time is the consideration of various plans for the pre-payment of medical service. This is recognized by practically all of our state societies and also by the American Medical Association. It is also recognized that, at the present time, there has not been formulated any plan which is applicable to the entire United States. It is still desirable that the various states attempt to work out some plan which is feasible within their own confines, in the hope that eventually some unified solution may be arrived at.

It is the opinion of this committee that some method of pre-payment for medical services is the only method available to the profession, which offers any hope of forestalling such measures as the Murray-Wagner-Dingell bill.

There are certain fundamentals which your committee believes must be observed, in the consideration of any prepayment plan:

First—the free choice of physicians on the part of the patients;

Second—the right of the individual physician to determine for himself whether he desires or does not desire to participate in such a plan; and

Lastly—that services should be rendered, and not a cash indemnity paid in event of illness.

The experience gained in caring for several hundred rural families in eastern Montana has been utilized. Studies have been made of plans in effect in other states, notably California, Washington, Oregon and Michigan, as well as certain plans in successful operation in parts of Canada. As a result of these studies, we are prepared to present to you for your consideration a plan which, in the opinion of the committee, could be adopted as a basis for state-wide action.

In accordance with the instructions previously given us, this committee is also prepared to submit at this time a revision of the minimum fee schedule for the Medical Association of Montana; bearing in mind, however, that this is a minimum fee schedule, to be utilized for families and organizations to which it may be applicable, and does not in any manner bind the members of the Association to conform with it in event the patient is able to pay a higher fee.

J. H. GARBERSON, M.D., Chairman

F. F. ATTIX, M.D.

R. B. DURNIN, M.D.

H. T. CARAWAY, M.D.

M. A. SHILLINGTON, M.D.

There was considerable discussion about the various types of prepaid insurance plans. Dr. M. A. Shillington gave an analysis of the various plans and a plan proposed for Montana, working on a basis already in effect in Montana. It was moved by Dr. Hurd and seconded by Dr. Farabaugh that the president appoint a committee of three to determine how best to get a referendum to determine how the doctors feel about an insurance plan for Montana. This motion was amended to include in the referendum the proposed minimum fee schedule. (However, on July 15 this amendment was rescinded unanimously after Dr. Hurd had made a motion to that effect and Dr. Durnin had seconded it.) The appointed referendum committee is composed of Dr. T. R. Vye, chairman, Dr. O. G. Klein, Dr. M. A. Shillington. Their report which was presented on July 15 is presented here to unify the records:

Referendum Committee

"We, the committee, recommend that each member of the state society be furnished data, to include outline of plan, insured's application, the doctor's agreement to give service, and other pertinent information.

It is recommended that the secretaries of component societies call a meeting of their respective societies within a period of two weeks after aforesaid information has been received, when the subject at hand will be discussed. Each member present to be given a ballot on which he will signify his desire to accept or reject the plan. These ballots to be sent to and tabulated by the state secretary. Also at the time of the local meeting where the balloting takes place, each society to elect a member to represent it at a corporate meeting, provided the measure is accepted. Said corporate meeting to be called by the state secretary within two weeks from the time the ballots are tabulated. Also it is recommended that the representatives of the California society be invited to be present at said organization meeting."

Tuberculosis Committee

The tuberculosis committee is pleased to report that during the past year a division of tuberculosis has been created under the state board of health. The state board of health is expected to hire a physician to supervise the tuberculosis activities in the state and to assume control of a mobile photoroentgen unit which was purchased by the state tuberculosis association. The mobile unit is expected to be delivered in December of this year, and it is hoped that operation will start by January 1st.

Several photoroentgen units will also be installed in cities throughout the state to aid in the tuberculosis control program.

A resolution was passed by the Montana State Medical asso-

ciation advising the governor of Montana, as chairman of the post-war construction and planning commission, of the need of a 150-bed modern hospital unit at the state tuberculosis sanatorium and urging that funds be allocated from the surplus funds in the state for post-war construction.

F. I. TERRILL, M.D., Chairman

Maternal and Child Welfare Committee

This committee serves primarily as the advisory committee to the Division of Maternal and Child Health of the Montana State Board of Health. The policies and the program are reviewed with the division director and recommendations made regarding policies and activities. Report is made as follows:

MORTALITY STUDIES: The five year study of maternal and infant mortality and stillbirths was closed as of January, 1945. Through the cooperation of the Montana physicians data has been collected by questionnaires on maternal and infant deaths and stillbirths since January, 1939. It is the plan to compile the results of the study during the coming year. Montana can be proud of the low maternal mortality rate during this period with 18 maternal deaths per 10,000 live births in 1944 as compared with 32 in 1939. The infant mortality rate in 1944 was 36 per 1,000 live births compared with 49 in 1939. The stillbirth rates are not comparable because the definition of a stillbirth has been changed, (from 24 weeks to 20 weeks gestation). The definition varies in many states and it is questionable whether reporting is complete. The neo-natal death rate has not been materially improved and the newborn, especially the prematurely born, still remains the problem which requires more attention and interest.

In 1944 there were 10,765 live births reported as compared with 11,258 in 1943. The birth rate however has remained high—23.3 in 1943 and 23.2 in 1944.

MATERNITY HOSPITAL INSPECTIONS: In the past five months every hospital and maternity home has again been inspected. The nursing problem has become critical in many hospitals and several have been forced to close because nurses are not available. Despite personnel problems and inability to obtain materials for improving facilities the majority of hospitals have cooperated to the greatest extent possible in meeting standards as required by the law and in following recommendations. The report is now being compiled. Your committee urges that study of standards and recommendations be made by every hospital staff so that highest possible standards will be maintained and hospital facilities for care of mothers and infants will be further improved.

PRENATAL AND PREMARITAL LAWS: Your committee recommended in the 1944 report that these measures be sponsored by the Montana State Medical society. The prenatal bill was passed and this law became effective as of July 1. The physicians have been sent copies of the law and every physician should give this matter careful attention.

The premarital bill was defeated in the house but reconsidered and passed. However, it was referred to the judiciary committee in the senate and was killed in committee. This bill unfortunately was confused with the "gim marriage" bill and more educational work will be necessary if this bill is to receive more favorable consideration by the 1946 legislative assembly.

PLASMA BANK: In the 1944 report your committee recommended that study be made of feasibility of establishing a plasma bank under the hygienic laboratory of the state board of health. A study was made by the director of the hygienic laboratory of similar services in other states. The bill providing funds for establishing a plasma bank was passed. Some difficulty was encountered in finding adequate laboratory space but plans are practically complete to set up machinery for carrying out the law so that plasma will be made available throughout the state.

POSTGRADUATE EDUCATION: It was not possible to arrange a postgraduate program during the past year but your committee has recommended that this program be carried out again as soon as possible since physicians cannot travel to other medical centers at this time and opportunities for scientific meetings are limited.

IMMUNE GLOBULIN FOR PREVENTION OR MODIFICATION OF MEASLES: This material has been made available through the American Red Cross to the state board

of health and will be supplied without charge at request of any physician. No charge for the material can be made to the patient and it is hoped physicians will use the immune globulin as a means of reducing complications and severity of measles especially in infants and young children and those below par.

E.M.I.C.: Since May 1943, 4,345 cases including maternity cases and infants have been authorized for care with total obligations to physicians and hospitals to the amount of \$358,119 through June 1945. Both physicians and hospitals have cooperated but it is understood that this is an emergency program for the duration of the war and is to be terminated six months after the close of the war as set forth in the law. Your committee has given considerable attention to the policies governing administration of this program. The basic policies are determined by the U. S. Children's Bureau which administers these funds. The state board of health must for the most part adopt the policies as set forth by the U. S. Children's Bureau and has very few alternatives. A number of modifications have been made since the program was initiated not only as result of experience in operating the program but also as the result of advising the Children's Bureau of the recommendations made by your committee. The fee for maternity care has been increased, provisions have been made for additional fees in exceptional cases and intercurrent conditions. Effort has been made to expedite authorizations and payment of claims to avoid unnecessary correspondence. The preparation of cost accounting statements by hospitals has resulted in better understanding of hospital rates in relation to costs, and more equitable adjustments have been made apart from this particular program.

The state board of health has taken exception to a number of the policies in the plan for the new fiscal year and your committee has made recommendations regarding policies which are not acceptable. Time does not permit review of these in this report but the physicians will be informed of any changes made. The state board of health is making every effort to administer the program in accordance with the highest standards of practice and in accordance with conditions in Montana.

It would be most helpful if the physicians enter as individuals, or through their local societies would refer matters relating to this program to this committee so that the committee could better interpret the problems and thereby serve more effectively. The Division of Maternal and Child Health has asked that the committee express to you the appreciation of the Division for the support which you have given to the program as a whole through your understanding, interest and active participation.

B. D. FARRAND, M.D., Chairman

Amendments to By-Laws

The following amendments proposed to the by-laws were presented:

1. The chairmen of all standing committees shall be responsible for keeping minutes of all committee meetings and that each county or district society in the state be notified by the secretary of the state medical society of the action taken at the committee meetings at least thirty days before any meeting of the house of delegates.

ELLIS W. ADAMS, M.D., Secretary,
Cascade County Medical Society.

This amendment was passed unanimously.

2. Upon the request of any delegate, any motion or resolution before the house shall be voted by roll call vote.

ELLIS W. ADAMS, M.D., Secretary,
Cascade County Medical Society.

It was moved by Dr. Hurd and seconded by Dr. Durnin that this amendment be tabled because it was already covered by Robert's Rules of Order for Parliamentary Procedure. Unanimously passed.

3. Section 19—delete the words "the two immediate past presidents" and in lieu thereof place the words "and two members of the Association elected by the House of Delegates for a term of two years except that at the first election under this amendment one member shall be elected to hold office for one year and one for two years."

H. T. CARAWAY, M.D.

Dr. Hitchcock moved and Dr. Hurd seconded that the

amendment be tabled. A standing vote was taken. Nine were in favor of tabling the amendment and eleven against. Dr. Berg made a motion that the amendment be amended to state that one man be elected to the executive committee instead of two. This was seconded by Dr. Walker but was withdrawn. The amendment as originally presented carried by a 12 to 9 vote.

The introduction of these three amendments was made on July 14 and the voting was on July 15.

It was moved by Dr. Hurd and seconded by Dr. Farabaugh that the president appoint a committee of three to revise the constitution and by-laws. Passed unanimously.

Dr. Chester W. Lawson and Dr. F. W. Aubin, delegates from the Hill County Medical society, introduced the following resolution:

"The Hill County Medical society has instructed us to voice an objection to the method used in handling the crippled children clinics. It is felt that the clinics should be presented under the auspices of the local medical society, and not independently of, and in competition with, the local profession."

Resolutions Committee

I. The House of Delegates of the Montana State Medical association has become aware of H. R. Bill 2969, introduced on April 19, 1945.

This body, representing the medical profession of Montana, feels that passage of the legislation contained in H. R. Bill 2969 would be harmful and should be opposed for the following two reasons:

1. The proposed law would usurp for the secretaries of war and navy the function now reserved to the several states through their boards of medical and dental examiners. This function is, namely, the determination of qualifications of those permitted to practice medicine and dentistry within the state.

By this proposed legislation the federal government would exercise functions constitutionally reserved to the states.

2. Under this proposed legislation, no provision would be made for termination of a license, no matter how the conduct of the licentiate might conflict with the public interest. All licentiates at present are subject to state jurisdiction, but it is doubtful whether former officers would be so subject under this proposed resolution.

RESOLUTION

Now, therefore, be it resolved, that the House of Delegates of the Montana State Medical association hereby expresses its opposition to the passage of H. R. No. 2969;

That a copy of this resolution be submitted to the Montana Dental association and the Montana Public Health league;

That a copy of this resolution be introduced into the house of delegates of the A.M.A. by the Montana delegate at the next following meeting.

L. W. BREWER, M.D., Chairman
R. G. JOHNSON, M.D.
T. F. WALKER, M.D.

RESOLUTION

II. The house of delegates of the Montana State Medical association, knowing of the very great need for additional hospital beds in the facilities at Galen, does hereby resolve:

That the request of the administration of the Montana State Tuberculosis sanatorium for state appropriation of \$521,000 for construction of an additional hospital building be supported by the Montana State Medical association;

That a copy of this resolution be submitted to the state committee on postwar construction, of which the governor of the state is chairman.

L. W. BREWER, M.D., Chairman
R. G. JOHNSON, M.D.
T. F. WALKER, M.D.

RESOLUTION

III. Whereas, for the past two days the delegates of the Montana State Medical society and their guests have been entertained in assembly and in banquet, and

Whereas, the entertainment has been of the finest quality and thoughtfully provided, and

Whereas, every consideration has been shown for the comfort and welfare of the delegates and their guests,

Therefore, be it resolved, that the house of delegates express hereby, to the Lewis & Clark County Medical society, its hosts, sincere appreciation for their hospitality, and

That a copy of this resolution be entered in the minutes of the house of delegates and also that a copy be submitted to the Lewis & Clark County society.

L. W. BREWER, M.D., Chairman
R. G. JOHNSON, M.D.
T. F. WALKER, M.D.

It was moved by Dr. Hurd and seconded by Dr. Walker that the economics committee be commended for their excellent work in preparing the new fee schedule and their work in laying plans for prepaid medicine. Passed unanimously.

Necrology Committee

Dr. E. B. Maynard (H), Choteau, born 1872, died February 1945. University of Michigan, Homeopath Medical school, graduated 1898, licensed state of Montana 1913.

Dr. Louis L. Mayland, Great Falls, born 1871, died 1945. University of Minnesota, graduated 1896, licensed 1911.

Dr. Hiram Bryan Cloud, Wolf Point, born 1885, died November 1, 1944. Hunting accident. Chicago College of Medicine and Surgery, licensed 1925.

Dr. Gaylord Worstell, Big Sandy, born 1863, died August 11, 1944. Graduated George Washington university 1899, licensed 1911.

Dr. Eugene Griffith Wilcox, Drummond, born 1894, died October 11, 1944. Carcinoma. Graduated Northwestern School of Medicine 1924, licensed 1924.

Dr. John Godfrey Thompson, Helena, born 1880, died February 15, 1945. Hypertension. Northwestern university 1906, licensed 1907.

Dr. Carl Frederick Bassow, Fort Benton, born 1883, died 1945. Pneumonia. Graduated Jefferson Medical college, Philadelphia, 1912, licensed in state 1912.

Dr. Henry Waldow Power, Conrad, born 1879, died 1945. Carcinoma of lung. Graduated Northwestern University Medical school 1903, licensed 1903.

Dr. Robert Wilson Getty, Deer Lodge, born 1868, died May 6, 1945. Heart attack at Gold Creek. Graduated University of Pennsylvania School of Medicine 1891, licensed 1893.

F. D. HURD, M.D., Chairman
A. R. FOSS, M.D.
H. W. GREGG, M.D.

All the above committee reports were accepted unanimously. There were no reports submitted for the following committees: Hospital, Medical Insurance and Legal Affairs, Postgraduate, Fractures, Industrial Hygiene, Medical Military Preparedness and Defense Activity, State Institutions, State District Committee for Special Business.

It was moved by Dr. Caraway and seconded by Dr. Tarbox that the state dues be raised to \$25 per individual. This carried by a standing vote of 22 for and 0 against.

It was moved by Dr. Cashmore and seconded by Dr. Atkins that the state association pay its \$100 membership dues to the Public Health League of Montana for 1945 and allow the Public Health league to solicit individual members for further funds this year. This was passed unanimously.

President J. C. Shields appointed Dr. J. H. Garberson and Dr. D. A. Atkins to conduct President-elect S. A. Cooney to the chair. He requested Vice President T. B. Moore to preside over the remainder of the meeting. Dr. Cooney responded to his induction as follows:

ADDRESS OF PRESIDENT-ELECT

Dr. S. A. Cooney
Helena, Montana

As a matter of completing the formal record, I hereby accept your election of me as president of the Montana State Medical Association for the year 1945-1946.

I am deeply humble in the presence of the honor you have conferred upon me, and ask from all of you your earnest cooperation and free and candid expression of your views at all times while I am your servant.

Basically, I have in mind:

1) That the Association, by all means within its power, extend to those members of the profession who have served in the armed forces of our country throughout the earth, all possible cooperation in their return to practice in our community. Despite our troubles at home, these men have made expenditures of strength, of fortune, of place and of opportunity in our behalf and in behalf of their fellow citizens generally, which

cannot be compensated. They did well by us; let us do well by them.

2) Protection of the profession against unjust attacks from politicians or from any others who fail to recognize the essential spirit with which all of us labor in the field of American medicine. The facts of our service, presented in a true light, are all we need at any time against any critic or criticism.

3) The elevation of the Association to a place in Montana where its members and its opinions are respected, and it is recognized as a definite force for spiritual as well as physical betterment.

In all of these things I need your prayers and your ready support.

Nominating Committee

The following report is submitted by the nominating committee of the medical association for consideration and action by the house of delegates:

For President-elect: Dr. Louis W. Allard, Billings, Dr. R. R. Sigler, Bozeman.

For Vice President: Dr. Walter H. Stephan, Dillon, Dr. G. A. Jestrab, Havre.

For Secretary-Treasurer: Dr. R. F. Peterson, Butte, Dr. H. T. Caraway, Billings.

For five names recommended to the governor of Montana for board of health appointment: Dr. T. F. Walker, Great Falls, Dr. L. W. Brewer, Missoula, Dr. F. I. Terrill, Galen, Dr. I. J. Bridenstine, Miles City, Dr. R. E. Ryde, Glasgow.

For Councilors: Dr. J. H. Garberson, Dr. Byron Tarbox, Dr. J. I. Wernham, Dr. T. R. Vye, Dr. E. A. Welden, Dr. R. G. Johnson, Dr. J. H. Irwin, Dr. F. E. Keenan.

The nominating committee of the Montana State Medical association submits the following names as candidates for ballot by election by the house of delegates for the terms of one and two years for the executive committee. The candidate receiving the highest number of votes will hold office for two years and the one receiving the second highest number of votes will hold office for one year: Dr. J. C. Shields, Dr. J. H. Bridenbaugh, Dr. J. H. Garberson, Dr. T. F. Walker.

For director of Public Health league: Dr. James Flynn, Dr. J. C. Shields.

F. F. ATTIX, M.D., Chairman

Election

Dr. A. R. Foss nominated Dr. M. A. Shillington as a candidate for president-elect. It was moved by Dr. Hurd and seconded by Dr. Berg that the nominations be closed. This carried unanimously. Dr. Allard requested that his name be withdrawn. Dr. Durnin moved and Dr. Caraway seconded that the rules be suspended to allow a standing vote, and Dr. M. A. Shillington was unanimously elected.

Dr. W. H. Stephan was elected vice president by a vote of 21 to 3.

Dr. Caraway withdrew as a candidate for the secretary-treasurer office, and Dr. R. F. Peterson was elected by a unanimous ballot.

Dr. Durnin recommended that for the board of health appointments the five names submitted be elected unanimously. Dr. Danskin seconded the motion and it carried unanimously.

Dr. Tarbox withdrew his name as candidate for councilor and the following councilors were elected unanimously: Dr. J. H. Garberson, District 3; Dr. T. R. Vye, District 4; Dr. R. G. Johnson, District 6; Dr. J. H. Irwin, District 8.

Dr. J. H. Irwin, delegate to the A.M.A., and Dr. E. M. Gans, alternate delegate, elected in 1944, carry over until 1946.

Drs. T. F. Walker and J. H. Garberson withdrew their names as candidates for the executive committee. Dr. B. R. Tarbox was nominated from the floor. Dr. Shields was elected for the two year term, Dr. Tarbox for the one year term by the following ballot: Dr. J. C. Shields, 25; Dr. B. R. Tarbox, 18; Dr. J. H. Bridenbaugh, 9.

Dr. Shields withdrew his name as candidate for the office of director to the Montana Public Health league, and Dr. James Flynn of Helena was elected unanimously.

It was moved by Dr. E. D. Hitchcock and seconded by Dr. F. F. Attix that the deepest appreciation of the Montana State Medical association be expressed to Dr. J. C. Shields for the extensive, efficient work that he conducted during his tenure of office. Passed unanimously.

The meeting was adjourned.

Montana State Medical Association Roster--1945

MEMBERSHIP BY DISTRICTS

CASCADE COUNTY MEDICAL SOCIETY

Dr. Earl Hall, Pres.	Great Falls	Hall, E. L.	Great Falls	★McGregor, J. F.	Great Falls
Dr. Ellis W. Adams, Sec.	Great Falls	Hitchcock, E. D.	Great Falls	McGregor, R. J.	Great Falls
Allred, I. A.	Great Falls	Holzberger, R. J.	Great Falls	★McPhail, F. L.	Great Falls
Adams, Ellis	Great Falls	Howard, L. L.	Great Falls	McPhail, Malcolm	Great Falls
Anderson, C. E.	Great Falls	Hurd, F. D.	Great Falls	★Nagel, C. E.	Great Falls
Andrews, F. L.	Great Falls	★Johnson, A. C.	Great Falls	★Peterson, C. H.	Great Falls
Bateman, H. W.	Choteau	Irwin, J. H.	Great Falls	Richardson, R. B.	Great Falls
Blankenhorn, C. E.	Great Falls	Keenan, F. E.	Great Falls	Russell, Rosannah	Fort Shaw
Bresee, C. J.	Great Falls	Keenan, T. M.	Great Falls	Schemm, F. R.	Great Falls
★Craigo, F. H.	Great Falls	Larson, E. M.	Great Falls	Setzer, G. W.	Malta
Cravy, L. S.	Fairfield	★Layne, J. A.	Great Falls	Shephard, H. C.	Flat River, Mo.
Davis, R. C.	Great Falls	Little, C. F.	Great Falls	Strain, Earle	Great Falls
Durnin, R. B.	Great Falls	Logan, P. E.	Great Falls	Templeton, C. F.	Great Falls
Fuller, H. W.	Great Falls	Lord, B. E.	Great Falls	★Vasco, J. R.	Great Falls
Gibson, H. V.	Great Falls	MacGregor, J. C.	Great Falls	Walker, Dora	Great Falls
Gleason, A. L.	Great Falls	★Magnier, Charles	Great Falls	Walker, T. F.	Great Falls
Greaves, J. P.	Great Falls	Maillet, L. L.	Great Falls	★Waniata, F. K.	Great Falls
★Hall, C. M.	Great Falls	McBurney, L. R.	Great Falls	Weisgerber, A. L.	Great Falls
		McGregor, H. J.	Great Falls	Williams, W. T.	Malta

CHOUTEAU COUNTY MEDICAL SOCIETY

Dr. D. J. Cooper, Pres.		Big Sandy	Dr. E. L. Anderson, Sec.-Treas.		Fort Benton
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FERGUS COUNTY MEDICAL SOCIETY

Dr. J. J. Elliott, Pres.	Lewistown	Attix, F. F.	Lewistown	★Gans, E. W.	Harlowton
Dr. E. M. Gans, V. Pres.	Harlowton	★Dismore, A. B.	Stanford	★Gans, Paul J.	Lewistown
Dr. F. F. Attix, Sec.-Treas.	Lewistown	★Eck, Raymond	Lewistown	Herring, J. H.	Lewistown
Alexander, J. L.	Winnett	Elliott, J. J.	Lewistown	Johnson, R. G.	Harlowton
		Freed, Hazel	Stanford	Porter, E. S.	Lewistown
		Gans, E. M.	Harlowton	Welden, E. A.	Lewistown

FLATHEAD COUNTY MEDICAL SOCIETY

Dr. L. G. Griffis, Pres.	Kalispell	Cairns, J. M.	Libby	Lees, A. T.	Whitefish
Dr. E. P. Cockrell, V. Pres.	Kalispell	Clark, C. A.	Eureka	Moore, T. B., Jr.	Kalispell
Dr. H. D. Huggins, Sec.	Kalispell	Cockrell, E. P.	Kalispell	Munro, A. T.	Kalispell
Dr. R. L. Towne, Treas.	Kalispell	Conway, W. Q.	Kalispell	Ross, F. B.	Kalispell
★Borkon, M.	Whitefish	★Delaney, J. R.	Kalispell	Simons, J. B.	Whitefish
Boyd, Edith	Whitefish	Dimon, John	Polson	★Stewart, R. M.	Whitefish
★Brown, J. W.	Whitefish	Dodge, A. A.	Kalispell	Taylor, W. W.	Whitefish
Brassett, A. J.	Kalispell	Griffis, L. G.	Kalispell	Towne, R. L.	Kalispell
★Burns, M. O.	Kalispell	★Holcomb, M. D.	Whitefish	★Weed, V. A.	Kalispell
		Huggins, H. D.	Kalispell	Wright, G. B.	Kalispell

GALLATIN COUNTY MEDICAL SOCIETY

Dr. E. R. Grigg, Pres.	Bozeman	★Craft, C. B.	Bozeman	Scherer, R. G.	Bozeman
Dr. W. S. Bole, V. Pres.	Bozeman	★Eneboe, P. L.	Bozeman	Seerley, C. C.	Bozeman
Dr. R. E. Seitz, Sec.	Bozeman	Grigg, E. R.	Bozeman	Seitz, R. E.	Bozeman
Bole, W. S.	Bozeman	Heetderks, B. J.	Bozeman	Sigler, R. R.	Bozeman
Bradbury, J. T.	Willow Creek	★Kearns, E. J.	Bozeman	Smith, C. S.	Bozeman
		Keeton, R. G.	Bozeman	Whitehead, C. E.	Bozeman
		Sabo, F. I.	Bozeman	Williams, R. A.	Bozeman

HILL COUNTY MEDICAL SOCIETY

Aubin, F. W.	Havre	Jestrab, G. A.	Havre
Benke, R. A.	Chester	Lacey, W. A.	Havre
Forester, W. L.	Havre	Lawson, Chester	Havre
Hamilton, W. F.	Havre	MacKenzie, D. S.	Havre
Hoon, A. S.	Chinook	★MacKenzie, D. S., Jr.	Havre
Houtz, C. S.	Havre	McCannel, W. A.	Harlem

LAKE COUNTY MEDICAL SOCIETY

(Discontinued temporarily)			
★Lipow, E. G.	Ronan	★Teel, H. M.	Polson
★Tanglin, W. G.	Polson	Venneman, F. W.	St. Ignatius

LEWIS & CLARK COUNTY MEDICAL SOCIETY

★Campbell, Robert	Helena	Gallivan, E. L.	Helena
Cashmore, W. F.	Helena	★Hawkins, T. L.	Helena
Cooney, S. A.	Helena	Hershey, Edythe	Helena
★Farner, L. M.	Helena	★Jump, C. F.	Helena
Flinn, F. M.	Helena	Kilbourne, B. K.	Helena

Klein, O. G. Helena
 ★Lindstrom, E. H. Helena
 ★McCabe, James Helena
 McElwee, W. R. White Sulphur Springs

★Mears, Claude Helena
 ★Monserrate, D. N. Helena
 Moore, O. M. Helena
 Morgan, R. M. Helena
 Morris, R. W. Helena

Nash, F. Townsend
 Shale, R. J. Helena
 ★Shearer, B. C. Helena

MADISON COUNTY MEDICAL SOCIETY

Dr. L. R. Packard, Pres. Whitehall
 Dr. R. H. Dyer, Sec.-Treas. Sheridan

Burns, W. J. Sheridan
 Clancy, D. F. Ennis
 ★Clancy, John Ennis

Dyer, R. H. Sheridan
 Farnsworth, R. B. Virginia City
 Packard, L. R. Whitehall

MOUNT POWELL COUNTY MEDICAL SOCIETY

Dr. B. L. Pampell, Pres. Warm Springs
 Anderson, G. A. Deer Lodge
 Brewer, A. D. Galen
 Dunlap, L. G. Anaconda

Holmes, G. V. Warm Springs
 Kargacin, T. J. Anaconda
 Knight, A. C. Philipsburg
 Long, W. E. Anaconda
 ★Malee, J. J. Anaconda
 Noonan, J. H. Anaconda

O'Rourke, J. L. Anaconda
 Pampel, B. L. Warm Springs
 Place, B. A. Warm Springs
 Terrill, F. I. Galen
 Tyler, K. A. Galen
 Unmack, F. L. Deer Lodge

MUSSELSHELL COUNTY MEDICAL SOCIETY

Dr. R. T. O'Neill, Pres. Roundup
 Dr. G. A. Lewis, Sec. Roundup

★Bennett, A. A. Roundup
 Brogan, R. E. Roundup
 Crouse, S. A. Roundup

Fouts, E. R. Ryegate
 Lewis, G. A. Roundup
 O'Neill, R. T. Roundup

NORTHCENTRAL MONTANA MEDICAL SOCIETY

Dr. W. C. Robinson, Pres. Shelby
 Dr. W. L. Dubois, Sec.-Treas. Conrad
 Bosshardt, O. A. Ontario, Calif.
 ★Cannon, P. S. Conrad

DuBois, W. L. Conrad
 Elliott, L. L. Cut Bank
 Neraal, P. O. Cut Bank
 Olsen, N. A. Cut Bank

Paterson, W. F. Conrad
 Robinson, W. C. Shelby
 ★Spatz, J. M. Cut Bank
 Whetstone, S. D. Cut Bank

NORTHEASTERN MONTANA MEDICAL SOCIETY

Dr. O. G. Benson, Pres. Plentywood
 Dr. R. E. Ryde, Sec.-Treas. Glasgow
 Agneberg, N. O. Glasgow
 Benson, O. G. Plentywood
 Cockrell, T. L. Hinsdale

Habel, W. P. Wolf Point
 Knapp, R. D. Wolf Point
 ★Knierim, F. M. Glasgow
 ★Krogstad, L. T. Wolf Point
 Larson, C. B. Glasgow
 Liest, L. J. Fort Peck
 ★Mittleman, E. J. Wolf Point

Morrow, T. M. Scobey
 ★Peterson, W. M. Plentywood
 Pronin, Arthur Plentywood
 Reed, W. H. Opheim
 Ryde, R. E. Glasgow
 ★Schweizer, H. W. Ft. Worden, Wash.
 Smith, A. N. Glasgow

PARK-SWEETGRASS MEDICAL SOCIETY

Dr. P. L. Greene, Pres. Livingston
 Dr. A. M. Lueck, V. Pres. Livingston
 Dr. E. M. Larson, Sec.-Treas. Livingston
 Baskett, L. W. Big Timber
 Claiborn, D. R. Big Timber

Cogswell, W. F. Helena
 Greene, P. L. Livingston
 ★Harris, W. E. Livingston
 Larson, Eloise M. Livingston
 Leard, S. E. Livingston
 Lueck, A. M. Livingston

March, J. A. Livingston
 ★Paul, F. W. Big Timber
 ★Pearson, J. A. Livingston
 Townsend, G. A. Emigrant
 ★Walker, R. E. Livingston
 Windsor, G. A. Livingston

SILVER BOW COUNTY MEDICAL SOCIETY

Dr. D. L. Gillespie, Pres. Butte
 Dr. S. V. Wilking, Sec. Butte
 Dr. C. R. Canty, Treas. Butte
 Atkins, D. A. Butte
 ★Bush, T. F. Butte
 Canty, C. R. Butte
 ★Carmichael, G. A. Butte
 Casebeer, H. L. Butte
 ★Casebeer, R. L. Butte
 Colman, J. K. Butte
 ★Donich, G. M. Butte
 Frisbee, J. B. Butte
 Garvey, J. E. Butte
 Gillespie, D. L. Butte
 Gregg, H. W. Butte
 ★Hale, D. E. Butte
 Hill, R. J. Whitehall
 Horst, C. H. Butte

James, H. H. Butte
 Kane, J. J. Butte
 Kane, P. E. Butte
 ★Kane, R. C. Butte
 Karsted, A. Butte
 ★Kroeze, R. Butte
 Lapierre, J. C. Butte
 Lhotka, J. F. Butte
 MacPherson, G. T. Butte
 Matthews, Vida J. Butte
 McGill, Caroline Butte
 McMahon, E. S. Butte
 Monahan, R. C. Butte
 ★Monahan, R. C., Jr. Butte
 Mondloch, J. L. Butte
 ★O'Keefe, N. J. Butte
 Odgers, S. L. Butte
 Pemberton, C. W. Butte

Peterson, R. F. Butte
 Poindexter, F. M. Dillon
 Rodes, C. B. Butte
 ★Routledge, G. L. Dillon
 Saam, T. W. Butte
 Schwartz, Harold Butte
 Schwartz, S. E. Butte
 Shields, J. C. Butte
 ★Sievers, A. R. Butte
 ★Steinberg, S. S. Butte
 Sievers, J. R. E. Butte
 Smith, L. W. Polson
 Spurck, P. T. Butte
 Stanchfield, H. Dillon
 Stephan, W. H. Dillon
 Thorkelson, Jacob Butte
 Ungerini, V. O. Butte
 Wilking, S. V. Butte

SOUTHEASTERN MONTANA MEDICAL SOCIETY

Dr. R. R. Randall, Pres. Miles City
 Dr. B. R. Tarbox, V. Pres. Forsyth
 Dr. I. J. Bridenstine, Sec. Miles City
 Beagle, J. S. Sidney
 Benson, R. D. Sidney
 Blakemore, W. H. Baker
 Bridenstine, I. J. Miles City
 Craig, J. W. Circle

★Dale, E. Wibaux
 Danskin, M. G. Glendive
 Farrand, B. C. Jordan
 Garberson, J. H. Miles City
 ★Harper, R. D. Sidney
 Haywood, Guy Forsyth
 Hogebohm, C. F. Baker
 Howard, Elna M. Miles City
 Huene, H. J. Forsyth

★Lemon, R. G. Glendive
 Lindeberg, S. B. Miles City
 Low, John E. Sidney
 Morrill, R. A. Sidney
 Noonan, E. F. Wibaux
 Olson, S. A. Glendive
 Parsons, H. H. Sidney
 ★Pratt, S. C. Miles City
 Randall, R. R. Miles City

Robbins, B. L. Glendive
 Rowen, E. H. Miles City
 Rundle, B. S. Circle

Sandy, B. B. Ekalaka
 Shillington, M. A. Glendive
 Tarbox, B. R. Forsyth

Thompson, J. R. Miles City
 Weeks, S. A. Baker
 Winter, M. D. Miles City

WESTERN MONTANA MEDICAL SOCIETY

Dr. J. M. Nelson, Pres. Missoula
 Dr. F. H. Lowe, V. Pres. Missoula
 Dr. J. L. Yuhas, Sec.-Treas. Missoula
 Alderson, L. R. Missoula
 Blegen, H. M. Missoula
 Bourdeau, C. L. Missoula
 ★Bourdeau, E. J. Missoula
 Boyer, Esther L. Missoula
 Brewer, L. W. Missoula
 ★Bussabarger, R. A. Missoula
 Doyle, W. Superior
 ★Duffalo, J. A. Missoula
 ★Fatic, G. F. Hot Springs
 Farabaugh, C. L. Missoula
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 Hayward, Herbert Hamilton
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 ★Murphy, E. S. Missoula

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 Yuhas, J. L. Missoula

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Adams, E. M. Red Lodge
 Allard, L. W. Billings
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 Benson, T. J. Fromberg
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Durnin, R. B.	Great Falls	Hoon, A. S.	Chinook	Matthews, Vida	Butte
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★Eck, Raymond	Lewistown	Houtz, C. S.	Havre	★McCabe, J. J.	Helena
Elliott, J. J.	Lewistown	Howard, Elna M.	Miles City	McCannel, W. A.	Harlem
Elliott, L. L.	Cut Bank	Howard, L. L.	Great Falls	McElwee, W. R.	White Sulphur Springs
★Eneboe, P. L.	Bozeman	Huene, H. J.	Forsyth	McGill, Caroline	Butte
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★Farner, L. M.	Helena	Hurd, F. D.	Great Falls	★McGregor, J. C.	Great Falls
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REPORT OF THE FOURTH ANNUAL MEETING OF THE WOMEN'S AUXILIARY TO THE MONTANA STATE MEDICAL ASSOCIATION

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The meeting of the board of directors of the Women's Auxiliary to the Montana State Medical association (which took the place of the fourth annual meeting) was called to order by the president, Mrs. J. M. Nelson, in Helena, July 15, 1945.

In the absence of the secretary, Mrs. W. E. Harris, Mrs. I. J. Bridenstine was appointed acting secretary.

Mrs. D. T. Berg of Helena welcomed the members of the auxiliary and announced place of meetings and entertainment.

Mrs. E. M. Larson reported for the committee which approved the minutes of the last session of the convention held July 14, 1944.

Annual reports of the state officers, committee chairmen, and county presidents were called for by the president and presented to the assembly.

The historian, Mrs. I. J. Bridenstine, presented the history of the organization to date and asked the members to look over the books.

A letter of resignation was read from the president-elect, Mrs. P. E. Griffin, and regretfully accepted.
(Continued on page 377)

The JOURNAL LANCET

Serves the
MINNESOTA, NORTH DAKOTA,

Medical Profession of
SOUTH DAKOTA AND MONTANA

Official Journal of the American Student Health Assn., Great Northern Railway Surgeons' Assn., Minneapolis Academy of Medicine, Montana State Medical Assn., North Dakota Society of Obstetrics and Gynecology, North Dakota State Medical Assn., Northwestern Pediatric Society, Sioux Valley Medical Assn., South Dakota Public Health Assn., South Dakota State Medical Assn.

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Dr. Irvine McQuarrie
Dr. Henry E. Michelson
Dr. C. H. Nelson
Dr. N. J. Nessa
Dr. Martin Nordland
Dr. J. C. Ohlmacher
Dr. K. A. Phelps
Dr. C. E. Sherwood
Dr. M. A. Shillington

Dr. J. C. Shirley
Dr. E. Lee Shrader
Dr. E. J. Simons
Dr. J. H. Simons
Dr. S. A. Slater
Dr. W. P. Smith
Dr. C. A. Stewart
Dr. S. E. Sweitzer

Dr. W. H. Thompson
Dr. E. L. Tuohy
Dr. M. B. Visscher
Dr. O. H. Wangensteen
Dr. S. Marx White
Dr. H. M. N. Wynne
Dr. Thomas Ziskin,
Secretary

LANCET PUBLISHING CO., Publishers, 84 South Tenth Street, Minneapolis 2, Minnesota

MINNEAPOLIS, MINNESOTA, OCTOBER, 1945

THE MEDICAL "CORRELATOR"

The general practitioner of medicine has been colorfully written up in book and story. He has been extolled as a kindly, unselfish and resourceful person who always responded day or night with that indefatigable vigor characteristic of pioneers and frontiersmen who refused to recognize the word "can't" in any emergency. His bravery appealed to men; his sympathetic understanding to women; and his helpfulness in trouble was recognized and appreciated by all. He has been referred to as a "doctor of the old school" leaving the impression that he belonged to the distant past and that general practitioners no longer exist. With little wonder he may be thought of as belonging to a vanishing race.

Fifty years ago he constituted the overwhelming majority of the profession and those doing referred work were few. That is no longer true. In the larger cities it is difficult for a newly arriving family to find a gen-

eral practitioner. Mostly there are specialists who limit their work to a certain field, which has given rise to the distinction that they know more about less while the general practitioner knows less about more. Reference to hospital staff classifications will prove the contention that doctors, with rare exceptions, are specialists. Clinics in like manner publish a departmentalized staff membership.

What's to become of the general practitioner who knows less about more, he who so often has called specialists in consultation? Why not reverse the process and let him be called by the specialists to piece together their findings, and if everyone must be designated by some high sounding title, the term "correlator" might be adopted. Every family should have one. If everyone insists on going to a specialist he could be called a specialist in correlation to whom they might apply for a gathering of the conclusions before treatment is instituted on an all-inclusive scale.

E. H.

COLLEGE HEALTH SERVICE

Current discussions of the health of young Americans, particularly men of military age, dwell upon the need for new health programs. Until existing tried agencies are developed to capacity, this demand for new implements is not justified.

Among these tried agencies are some 200 college student health departments organized since 1908 and serving in normal times a half million potential leaders.

The activities of all these health services are essentially the same: routine physical examination of students to appraise their health status, advice on correction of remediable physical defects and improper health habits, health education, participation in physical exercise and in campus sanitation programs and, in most schools, variable facilities for emergency medical care.

The good results accruing from these programs are limitless and bounded only by the sympathy of the college administration and the earnestness and quality of training of the health service personnel. Every student attending a college in which there is a modern health service should carry away with him an appreciation of the importance of rationally applied preventive medicine, an improved health status and certainly better discrimination in selecting high class medical service.

A disproportionate number of physicians has been diverted from college health services during the war for two chief reasons: a majority of college health physicians are in the younger age groups, and most colleges suffered heavy losses in enrollment. The need for suitably interested and trained physicians, and other personnel, in college health services is great. The work offers opportunities for the highest type of preventive and therapeutic medicine. The opportunities for clinical research are limitless.

Full utilization of existing college health services and extension of many of their features to the secondary schools would do much toward solving the problem of better health for American youth.

RALPH I. CANUTESON, M.D., President,
American Student Health Association

MEDICAL ART SHOW

The National Medical Art Show, sponsored by *Modern Medicine*, a medical publication, representing the work of twenty-six medical artists, was on display during the month of August at The Museum of Hygiene and Medicine, the Mayo Foundation. While the current work of artists associated with medical schools and clinics and hospitals evoked great interest among the medical profession, the historical exhibit showing the progress of medical art from earliest times of Max Broedel also attracted many observers. Vera Morel, the medical artist at Tulane University, who prepared the exhibits, showed examples of the parchment manuscripts which provided the first graphic representation of human anatomy; drawings from Persian manuscripts; and wood cuts from the *Fasciculus Medicinæ*, a book printed in 1491. A sample of the "broadsides" prepared for medical students and the public, about 1499, was also on display. Original exhibits of the work of Max Broedel were a loan from his daughter, Elizabeth Broedel, a

medical illustrator with the Women's Clinic New York Hospital.

The work of Russell Drake, for many years the medical artist with the Mayo Clinic, was of particular interest to Rochester. Among his exhibits was a group of drawings showing the various stages from the original sketch made beside the surgeon as he operates, to the finished drawing.

Other exhibiting artists included Theodora Bergsland of Western Reserve University, who once studied at the Mayo Clinic; Annette Burgess, of the Wilmer Institute, Johns Hopkins Medical School; Mildred Codding of Peter Bent Brigham Hospital, Lucille Cassell and Mary Dixon of Northwestern University; James F. Didusch, Carnegie Institute of Washington, and Johns Hopkins Medical School, Armin Hemberger, Yale University School of Medicine, Jean Hirsch, University of Minnesota, Edna Hill, University of Pennsylvania Medical School, Natt Jacobs, University of Rochester School of Medicine, Tom Jones, University of Illinois, Helen Lewis Lous, The Lahey Clinic, Muriel McLatchie, Massachusetts General, Janet McLaughlin, Eloise Hospital, Gladys McHugh, University of Chicago, E. Vardell McNett, Lankenau Hospital, Wm. Brown McNett, The Blakiston Co., Etta Piotti, Harvard Medical School, W. C. Shepard, W. B. Saunders Co., Ralph Sweet, University of California Medical School.

Opening September 23rd Philadelphia at the College of Physicians, the exhibit will run until October 20.

(Received too late for inclusion in September issue)

Duluth, Minnesota, August 24, 1945
THE JOURNAL-LANCET,

James Gray, in his column appearing in our paper two days ago, sounded the grief that is in all our hearts over the passing of Dr. Mabel Ulrich. And since she wielded such a goodly influence over the *Lancet* in recent years, as editorial adviser, I ask permission to express to you and your readers something of the loss that is ours.

Just before me is the August *Lancet* with her "Capital Punishment for Capitals" editorial. There is an over-abundant medical literature. "Capital punishment" should be visited upon much of it.

Dr. Mabel's work was far from finished — in the many fields in which she pleaded with our profession (and others) for a deeper appreciation of good writing and living. Now that she is gone we recall that we seldom went out of our way to acknowledge our appreciation of her and her magnificent talents. Adios, brave and courageous citizen, writer and physician.

E. L. TUOHY, M.D.,
President, Minnesota State Medical Society

The American Board of Ophthalmology has postponed the Chicago October examinations until January 18 through 22.

The Mid-West Clinical society with headquarters in Omaha, will hold its annual session October 22 through 26. The secretary-director of clinics is Dr. Roy W. Fouts, 1031 Medical Arts Building, Omaha 2, Nebraska.

**LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
JULY 13, 1945 (June Examination)**

Name	School	Address
Ackerman, Robert Featherston	U. of Tenn. M.D. 1943	Mayo Clinic, Rochester, Minn.
Alden, John Fredolph	U. of Minn. M.B. 1945	1559 Fairmount Ave., St. Paul 5, Minn.
Anderson, Harry J.	U. of Minn. M.B. 1945	North Branch, Minn.
Askren, Edward Leroy, Jr.	U. of Ill. M.D. 1943	Mayo Clinic, Rochester, Minn.
Bartholomae, Warren Max	U. of Minn. M.B. 1945	459 W. Wabasha, Winona, Minn.
Belshe, Joseph Charles	U. of Minn. M.B. 1945	806 Division St., Northfield, Minn.
Benson, Lyle Myrvan	U. of Minn. M.B. 1945	Canby, Minn.
Bergendahl, Emil Henry	U. of Minn. M.B. 1945	St. Joseph's Hospital, Milwaukee, Wis.
Bohn, Donald George	U. of Minn. M.B. 1945	4625 Nicollet Ave., Minneapolis 9, Minn.
Borgen, Alfred Edwin	U. of Minn. M.B. 1945	Culver, Minn.
Breneman, James Chester	U. of Minn. M.B. 1945	Sherburn, Minn.
Brown, Spencer Franklin	U. of Minn. M.B. 1945	706 Delaware St. S.E., Minneapolis 14, Minn.
Busard, John Max	U. of Mich. M.D. 1943	Mayo Clinic, Rochester, Minn.
Craig, M. Elizabeth	U. of Minn. M.B. 1945	510—15th Ave. S.E., Minneapolis 14, Minn.
Davis, Tom II	U. of Minn. M.B. 1945	Wadena, Minn.
DeLand, Clyde LeRoy	U. of Wis. M.D. 1943	367 Champion St., Battle Creek, Mich.
Deranleau, Robert Francis	U. of Minn. M.B. 1945	Northwestern Hospital, Minneapolis 7, Minn.
Dickman, Roy Willard	U. of Minn. M.B. 1945	5716 Longfellow Ave. S., Minneapolis 7, Minn.
Dille, Donald Everett	U. of Minn. M.B. 1945	Dassel, Minn.
Doms, Vernon Albert	U. of Minn. M.B. 1945	Woodstock, Minn.
Drake, Robert McCall	U. of Minn. M.B. 1945	4751 Girard Ave. S., Minneapolis 9, Minn.
DuBois, Julian Faville, Jr.	N. Y. Med. Coll. M.D. 1945	Sauk Centre, Minn.
Eldred, Ruth Elizabeth	U. of Minn. M.B. 1945	721—8th St., Bismarck, N. D.
Ely, Robert Stewart	U. of Minn. M.B. 1945	212—4th Ave. S., South St. Paul, Minn.
Fearing, James Edward	U. of Minn. M.B. 1945	536—11th St. So., Virginia, Minn.
Feinberg, Samuel Burton	U. of Minn. M.B. 1945	916 Newton Ave. N., Minneapolis 11, Minn.
Feldman, Seymour Irving	U. of Minn. M.B. 1945	801 Huron St. S.E., Minneapolis 14, Minn.
Fliehr, Richard Reid	U. of Minn. M.B. 1945	1810 Bryant Ave. S., Minneapolis 5, Minn.
Flynn, Louis Leo, Jr.	U. of Minn. M.B. 1944	523—8th Ave. N., South St. Paul, Minn.
Fortier, Quincy Ernest	U. of Minn. M.B. 1944	2109 Larpenteur Ave. W., St. Paul, Minn.
Fox, James Rogers	U. of Minn. M.B. 1945	1572 Portland Ave., St. Paul 5, Minn.
Furnell, Dale Quinn	U. of Minn. M.B. 1945	1812 Portland Ave., St. Paul 5, Minn.
Gaard, Richard Carl	U. of Minn. M.B. 1945	505 S. Cretin, St. Paul 5, Minn.
Gholz, Anthony Carroll	U. of Minn. M.B. 1945	3005 James Ave. S., Minneapolis 8, Minn.
Glaede, Warren Carleton	U. of Minn. M.B. 1945	757 Dayton Ave., St. Paul, Minn.
Glaeser, John H.	U. of Minn. M.B. 1945	Swanville, Minn.
Graiewski, Stanley John	U. of Minn. M.B. 1945	200 Ridge St., Ironwood, Mich.
Grais, Melvin L.	U. of Minn. M.B. 1945	1210 James Ave. N., Minneapolis 11, Minn.
Green, Cloid Darryl	U. of Minn. M.B. 1945	1526 S. Main Ave., Sioux Falls, S. D.
Haberle, Charles Albert	U. of Minn. M.B. 1945	2939 Polk St. N.E., Minneapolis 13, Minn.
Hartman, Mortimer Albert	U. of Minn. M.B. 1944	1736 Penn Ave. N., Minneapolis 11, Minn.
Havens, Fred Z.	U. of Minn. M.B. 1945	1121—10th St. S.W., Rochester, Minn.
Hedenstrom, Philip Carl	U. of Minn. M.B. 1945	Cambridge, Minn.
Hirsh, Stanton Allen	U. of Minn. M.B. 1945	1800 Bayard Ave., St. Paul 5, Minn.
Hoganson, Donald Earl	U. of Minn. M.B. 1944	1319 Bixby Ave., Bemidji, Minn.
Huber, Robert W.	U. of Minn. M.B. 1945	403 Case, St. Paul 1, Minn.
Hunt, William	U. of Minn. M.B. 1945	107 Homewood Dr., Fairmont, Minn.
Jensen, Louis Christian, Jr.	U. of Minn. M.B. 1945	5038—34th Ave. S., Minneapolis 6, Minn.
Johnson, David Randolph	U. of Minn. M.B. 1945	RFD No. 2, Benson, Minn.
Johnson, Einer Wesley, Jr.	U. of Minn. M.B. 1944	605 Lake Blvd., Bemidji, Minn.
Johnson, Herbert Wesley	U. of Minn. M.B. 1945	719 Sherwood Ave., St. Paul 6, Minn.
Juergens, Manley Frederick	U. of Minn. M.B. 1945	Belle Plaine, Minn.
Kanne, Earl Rupert	U. of Minn. M.B. 1945	Bigfork, Minn.
Karon, Allan Burton	U. of Minn. M.B. 1945	2007 Summit Ave., St. Paul 5, Minn.
Kelley, Vincent Charles	U. of Minn. M.B. 1945	Canby, Minn.
Kelly, William Daniel	U. of Minn. M.B. 1945	2215 St. Clair Ave., St. Paul 5, Minn.
King, Robert Lee, Jr.	U. of Minn. M.B. 1945	5729 Michigan Ave., St. Louis 11, Mo.
Kiriluk, Lawrence Ben	U. of Minn. M.B. 1945	Hallock, Minn.
Knoche, Harvey A., Jr.	U. of Minn. M.B. 1945	Adrian, Minn.
Kotval, Russell J.	U. of Minn. M.B. 1945	Vesta, Minn.
Koza, Donald Warren	U. of Minn. M.B. 1945	309 W. Page St., St. Paul 7, Minn.
Kucera, William John, Jr.	U. of Minn. M.B. 1945	5047 Gladstone Ave. S., Minneapolis 9, Minn.
Landa, Marshall	U. of Minn. M.B. 1944	1245 Oliver Ave. N., Minneapolis 11, Minn.
Larson, Oliver Edward Henry	U. of Minn. M.B. 1945	Elgin, Minn.
Lee, Madison Johnson, Jr.	Tulane U. M.D. 1944	Mayo Clinic, Rochester, Minn.
Leider, Allan Richard	U. of Minn. M.B. 1945	1015 Beech Ave., St. Paul 6, Minn.
Lerner, Aaron	U. of Minn. M.B. 1945	827 Oliver Ave. N., Minneapolis 11, Minn.
Lie, Dagfinn	U. of Minn. M.B. 1945	Fisher, Minn.
Lindgren, Verner V., Jr.	U. of Minn. M.B. 1945	Winnebago, Minn.
Litin, Edward Mortimer	U. of Minn. M.B. 1945	1614 Penn Ave. N., Minneapolis 11, Minn.
Loomis, Earl Alfred Jr.	U. of Minn. M.B. 1945	2027 Kenwood Pkwy., No. 211, Minneapolis 5.
Louisell, Charles Tallon	U. of Minn. M.B. 1944	2630 E. 1st St., Duluth 5, Minn.
Lund, George B.	U. of Minn. M.B. 1945	Clarkfield, Minn.
Lundsten, Leslie Charlton	U. of Ill. M.D. 1944	Bethesda Hospital, St. Paul 1, Minn.
MacDonald, John Walker	U. of Minn. M.B. 1945	1932 Humboldt Ave. S., Minneapolis 5, Minn.
Maloney, William Farlow	U. of Minn. M.B. 1945	1720 W. 31st St., Minneapolis 8, Minn.

Name	School	Address
Mandel, Sheldon Charles	U. of Minn. M.B. 1945	1001 Newton Ave. N., No. 202, Minneapolis 11.
Maunder, John Blackmore	U. of Minn. M.B. 1945	325 Grand St., Ft. Atkinson, Wis.
McGeary, George Daniel	U. of Minn. M.B. 1944	5045 Garfield Ave. S., Minneapolis 9, Minn.
Meadows, James Allen, Jr.	Tulane U. M.D. 1944	Mayo Clinic, Rochester, Minn.
Miners, George Wallace	U. of Minn. M.B. 1945	3148 Irving Ave. S., Minneapolis 8, Minn.
Mulholland, William Melville	U. of Minn. M.B. 1944	5301 Chateau Place, Minneapolis 7, Minn.
Muller, John Joseph	U. of Minn. M.B. 1945	Hingham, Mont.
Nelson, David John	U. of Minn. M.B. 1945	500 Garfield St., Austin, Minn.
Nelson, Paul Andrew	U. of Minn. M.B. 1945	3110—5th Ave. S., Minneapolis 8, Minn.
Newcomb, Carl E.	U. of Minn. M.B. 1945	Good Samaritan Hospital, Los Angeles, Calif.
Newman, John Anderson	U. of Minn. M.B. 1945	1217 W. Platinum St., Butte, Mont.
Nimlos, Kenneth O.	U. of Minn. M.B. 1945	Stephen, Minn.
Nimlos, Lenore Ostergren	U. of Minn. M.B. 1945	Rt. 7, Lake Gervais, St. Paul, Minn.
O'Brien, John Charles	U. of Ill. M.D. 1944	St. Joseph's Hospital, St. Paul 2, Minn.
O'Brien, William Austin, Jr.	U. of Minn. M.B. 1945	1589 Northrop St., St. Paul 8, Minn.
Palm, Ernest Theodore	U. of Minn. M.B. 1945	506—4th St., Braddock, Pa.
Paulson, Eric Randolph	U. of Minn. M.B. 1945	Turtle Lake, N. D.
Peik, Donald John	U. of Minn. M.B. 1945	Brownston, Minn.
Peterson, Willard Hall	U. of Minn. M.B. 1945	519 Marshall Ave. N., Litchfield, Minn.
Petersen, William E.	U. of Minn. M.B. 1945	1447 Chelmsford St., St. Paul 8, Minn.
Plasha, Matthew Karl	U. of Minn. M.B. 1945	314 University Ave. S.E., Minneapolis 14, Minn.
Rall, Joseph Edward	Northwestern M.B. 1944, M.D. 1945	Mayo Clinic, Rochester, Minn.
Reitmann, John Henry	U. of Minn. M. B. 1944	908 Bush St., Red Wing, Minn.
Reizman, Bert	U. of Minn. M.B. 1945	874 Linwood Ave., St. Paul 5, Minn.
Rozycki, Anthony Thomas	U. of Minn. M.B. 1945	Blackduck, Minn.
Runquist, John Manley	U. of Minn. M.B. 1945	211 Kene Rd., Duluth, Minn.
Sandeen, Robert McFarlane	U. of Minn. M.B. 1945	126 N. Everett St., Stillwater, Minn.
Schnugg, Francis Joseph	U. of Minn. M.B. 1945	750 Main St., Hackensack, N. J.
Siglin, Irvin S.	U. of Chicago - Rush M.D. 1940	Mayo Clinic, Rochester, Minn.
Skogerboe, Rudolph Benjamin	U. of Minn. M.B. 1945	Erskine, Minn.
Spencer, Bernard James	U. of Minn. M.B. 1945	Blue Earth, Minn.
Sprafka, Joseph Lynold	U. of Minn. M.B. 1945	Ancker Hospital, St. Paul 1, Minn.
Storaasli, John Phillip	U. of Minn. M.B. 1945	1200 Pitts St., Alexandria, Va.
Strouth, Bernard Peter	U. of Minn. M.B. 1945	Rt. 5, Faribault, Minn.
Stutzman, Francis Lloyd	U. of Minn. M.B. 1945	Newport, Minn.
Sweetser, Theo. Higgins, Jr.	U. of Minn. M.B. 1945	4240 Garfield Ave. S., Minneapolis 9, Minn.
Thiem, Chester Ekholm	U. of Minn. M.B. 1945	Gibbon, Minn.
Tichy, Fae Yvonne	U. of Minn. M.B. 1944	3546 Russell Ave. N., Minneapolis 12, Minn.
Tillotson, Irving Gray	U. of Minn. M.B. 1945	2264 Commonwealth Ave., St. Paul 8, Minn.
Twomey, John Edward	U. of Minn. M.B. 1945	647 Thomas Ave., St. Paul 4, Minn.
Werner, George	U. of Minn. M.B. 1942, M.D. 1943	1239 Russell Ave. N., Minneapolis 11, Minn.
Whiting, Adolph Martin	U. of Minn. M.B. 1945	2400 Vincent Ave. N., Minneapolis 11, Minn.
Williams, Walter Samuel	Tulane U. M.D. 1941	Mayo Clinic, Rochester, Minn.
Wisness, Osmund Arthur	U. of Minn. M.B. 1945	721—9th St. W., Willmar, Minn.
Wood, George F., Jr.	Temple U. M.D. 1944	112—4th Ave. S.W., Watertown, S. D.
Wood, Newell Edwin	U. of Minn. M.B. 1945	725—4th Ave. N., Valley City, N. D.
Yaeger, John J.	U. of Minn. M.B. 1945	Sanborn, Minn.
Zaworski, Leo Albert	Marquette U. M.D. 1944	1301 N.E. Jefferson St., Minneapolis 13, Minn.

RECIPROCITY CANDIDATES

Anderson, Gordon Arnold	U. of Minn. M.B. 1934, M.D. 1935	Deer Lodge, Mont.
Cole, Frank Abraham	L.I.Col. of Med. M.D. 1934	1425 LaSalle Ave., Minneapolis 4, Minn.
Radl, Cyril Joseph	Marquette U. M.D. 1932	2746 Stinson Blvd., Minneapolis 13, Minn.
Skroch, Eugene Edward	U. of Wis. M.D. 1943	Mayo Clinic, Rochester, Minn.
Watts, Campbell Franklin	U. of Iowa M.D. 1943	Mayo Clinic, Rochester, Minn.

NATIONAL BOARD CANDIDATE

Morrow, J. Robert	U. of Buffalo M.D. 1943	Mayo Clinic, Rochester, Minn.
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WOMEN'S AUXILIARY

(Continued from page 373)

Dr. J. P. Ritchey, chairman of the advisory board to the auxiliary, addressed the auxiliary on the relationship between it and the advisory board and the obligation to the Montana State Medical association. He presented from the advisory board a written outline of suggestions for revision of the present constitution. The board urged the adoption of a state project.

Dr. J. C. Shields, president of the state medical association, emphasized streamlining the organization and eliminating non-essentials. He suggested making the directive groups small enough to work efficiently. He also urged a postwar project.

Mrs. H. W. Peterson, president of the Public Health League of Montana, gave a most interesting review of the year's activities in the league and suggested the auxiliary be formally represented in the league.

Dr. B. K. Kilbourne, of the state health department, spoke at the Sunday morning session upon the health needs of the state and the new full-time health units set up by the last legislature. He asked the auxiliary to take an active part in pro-

moting health education in the various communities of the state. Mmes. E. M. Larson, D. T. Berg and J. P. Ritchey were appointed to inspect the minutes of the last day's meeting.

The following names for officers for the year 1945-46 were presented by the chairman of the nominating committee, Mrs. D. T. Berg, and the panel was given unanimous approval.

For president, Mrs. I. J. Bridentsine, Terry.

For president-elect, Mrs. Harold Schwartz, Butte.

For 1st vice president, Mrs. Roy Morledge, Billings.

For 2nd vice president, Mrs. F. B. Ross, Kalispell.

For treasurer, Mrs. A. A. Dodge, Kalispell.

For secretary, Mrs. H. T. Caraway, Billings.

For directors (2 year term), Mrs. A. C. Knight, Phillipsburg, Mrs. R. W. Morris, Helena; (1 year term), Mrs. F. F. Attix, Lewistown (completion of the term of Mrs. Harold Schwartz).

The meeting was adjourned with Mrs. I. J. Bridentsine, the new president, in the chair.

MRS. W. E. HARRIS, Secretary
MRS. J. M. NELSON, President

News Items

Albert J. Bateson, a soldier in Seattle, has appealed to the Grand Forks doctor who treated him some years ago and whose name he has forgotten. Any reader whose practice was in that city and who has soldier Bateson's name on his records will confer an appreciated favor by so advising H. W. Fredericks, Grand Forks Chamber of Commerce who will forward information.

Elmer H. Bobst, Nutley, New Jersey, retired president of Hoffmann-LaRoche and Roche-Organon pharmaceutical corporations, has been elected chairman of the executive committee of the board of directors of the American Cancer society.

Dr. Jas. J. McCabe, Helena, Montana, captain, in army service for three years, part of the time in Africa, France and Germany, for which service in surgery he was awarded the bronze star, has been home with his family for a month and was at his father's deathbed.

North Dakota state medical center advisory council includes in its membership Drs. Geo. F. Campana of Bismarck, state health officer as an ex-officio member and Dean Harley E. French of the University medical school who serves as secretary. Dr. Jno. H. Moore, Grand Forks, represents the state medical association.

Dr. B. B. Sedlacek, formerly a North Dakota hospital superintendent and more recently head of Indian hospitals in Arizona, has relieved Dr. M. K. Mirhan, now on sick leave, at Sioux Sanatorium, Rapid City, So. Dak.

Dr. Thomas Hall Shastid, Duluth, 79-year-old physician, has contributed to the country's growing mass of medical miscellany a voluminous self-revealing book, *My Second Life*.

Technical sergeant Jas. Hagen of Moorhead, Minnesota, son of Dr. Olaf J. Hagen, who was reported missing in a Liberator plane over Lynz, Austria, July 25, 1944, was declared early in August 1945 "killed".

Dr. Everett H. Lindstrom, Helena, major in the army, told fellow members of the Kiwanis club of his city about his experiences in thirty-six months of south Pacific jungle combat service. Dr. Lindstrom practiced in Helena for fourteen years before joining the army. He left September 15 for three months graduate work in surgery at the New York Polytechnic.

Necrology

Dr. Chas. H. Patterson, 60, Fargo, North Dakota, member of the staff of veterans hospital in that city, died unexpectedly August 8 at that hospital, to which he had been taken by ambulance from his Pelican Lake cottage, where he was stricken with a heart ailment. He was a native of Minnesota, graduate of Hamline medical school the year it was merged with the University of Minnesota and his earlier practice had been in North Dakota—at

Alice, Enderlin and Edinburg. For the last sixteen years he had been connected with the veterans administration.

Dr. Guy Ramsey, 75, Sioux Falls, South Dakota, company doctor at the Mortell packing plant in that city, died in a hospital in Sioux Falls, August 19. A Pennsylvanian by birth, he graduated from Drake university in 1901 and had practiced, among several places, in Eureka, Salem and Philip.

Dr. Joseph A. Smith, 61, Minot, North Dakota, died August 13 at a Minot hospital from a heart attack. For the last seven years he had been eye, ear, nose and throat specialist at Northwest clinic. His birthplace was Ellendale and after two years of practice at York he served Noonan as surgeon and physician for thirty-three years.

Dr. Bernard Vincent McCabe, 73, Helena, Montana, died August 25 at St. John's hospital after a seven years illness, the last two years spent in hospital. He graduated from the medical school of University of Illinois in 1908 and for several years was president of Lewis and Clark medical society.

Classified Advertisements

FOR SALE

Physician and surgeon's high grade instruments and equipment, almost new. Write Chris J. Hill, Adm., Washburn, No. Dak.

FOR SALE

Priced for quick sale, late model Picker Waite 30 ma. shock-proof x-ray unit, tilt Bucky table. Excellent condition. Address Box 824, care of this office.

EXCEPTIONAL OPPORTUNITY

for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory in new office building located in very best residential retail section. Address Box 761A, care of this office.

ASSISTANCE AVAILABLE

Aznoe's, established in 1896, has available a number of well trained physicians (diplomates of the specialty boards, industrial physicians and surgeons, general practitioners, psychiatrists, tuberculosis specialists and residents). For histories, write Ann Woodward, Aznoe's Woodward Medical Personnel Bureau, 30 North Michigan Ave., Chicago 2, Ill.

FOR SALE

One articulated skeleton 5' 6" tall, in oak cabinet. Two ribs on right side fractured, but so when purchased from Noyes Bros. & Cutler about 1904 (high school borrowed it and painted the front with luminol). Price \$60 f.o.b. Carrington, N. D. Edwin L. Goss, M.D., Carrington, N. D.

FOR SALE

X-ray and equipment, instrument cabinet, stands, lights, eye-testing outfit, office furniture; 12 pieces: sacrifice for quick sale. Complete list furnished on request. Write B. M. Hart, M.D., Onida, S. D., at once, marking envelope "equipment inquiry."

Every minute of a doctor's time consumed in doing what an assistant could do means reduced income and a slow-up of service to patients. Classified advertisements in THE JOURNAL-LANCET secure competent assistants promptly for doctors, preserving the anonymity of the advertiser by means of a blind address.

Sedative-Antispasmodic



THREEFOLD ACTION

Syntronal 'Roche' selectively inhibits parasympathetic terminations in smooth muscle. In addition, it has a direct relaxing effect on spastically contracted smooth muscle and it also relieves nervous tension and apprehension which are often important factors in spastic disorders. Syntronal will be found a valuable agent in spastic disorders of the gastrointestinal and urinary tracts, and in spastic dysmenorrhea. Syntronal is available in sugar-coated tablets, each containing 50 mg of Syntropan 'Roche' (phosphate of d,L-tropic acid ester of 3-diethylamino-2,2-dimethyl-1-propanol) and 15 mg of phenobarbital. Write to Department A-6 for a clinical sample of Syntronal. . . .

HOFFMANN-LA ROCHE, INC., ROCHE PARK, NUTLEY 10, N. J.

S Y N T R O N A L
'Roche'

Advertisers' Announcements

FRANKLIN HOSPITAL

To fill a need for practical nursing service during the war emergency and the post-war dislocation, Franklin Hospital, Minneapolis, initiated a nine months course for the training of practical nurses in April 1944. A group of 23 nurses was graduated in May 1945. Classes are now being started at four month intervals throughout the year. January 3 is the next entrance date. Franklin Hospital caters primarily to the chronic and convalescent patient.

A NEW ALBUMIN TEST

A new qualitative test for albumin is now available under the name Albumintest. This new method provides a simple, reliable test for albumin that can be carried easily and safely by physicians and public health workers. It is equally satisfactory for large laboratory operations.

The reagent which is nonpoisonous and noncorrosive is made as needed by adding one reagent tablet to 4 cc. of water. Bulk solutions for the laboratory can be prepared by using the same proportions.

The technics are based upon original clinical studies by recognized authorities in the fields of pathology and public health. These technics include both contact ring and turbidity methods—no heating is required. The one to be followed is a matter of choice.

The test was developed in the research laboratories of Ames Company, Inc., as a companion test to the Clinitest tablet method for detecting urine-sugar. The original laboratory work was begun in 1941 by J. A. Kamlet, Ph.D., W. A. Compton, M.D., and R. S. Nicholls. Clinical studies have been in progress since 1943.

Distribution of Albumintest tablets will be through the regular drug and medical supply channels. Two bottle sizes will be available, 36's and 100's.

"COURAGE AND DEVOTION BEYOND THE CALL OF DUTY"

Mead Johnson & Company published, some time ago, the preliminary edition of a book under the above title which is "a partial record of official citations to medical officers in the United States Armed Forces during World War II." In its 250-odd pages are the battle stories of 244 doctors and eight military units whose names have been made glorious for all time by the awards of the Soldier's Medal, the Silver Star, the Bronze Star, the Legion of Merit, the Navy Cross, the Naval Reserve Medal, the Purple Heart, the Distinguished Service Medal, the Air Medal, the Navy and Marine Corps Medal, the Distinguished Flying Cross, the Certificate of Commendation, the Presidential Unit Citation, the Oak Leaf Cluster to the D.S.M., the cluster to star, the Victory Medal and various other citations and commendations for gallantry in action and outstanding heroism.

As is the custom with this company, the little volume is handsomely made and, with the additions and corrections which will be included in the complete postwar edition, will memorialize the medical men who rendered exceptionally meritorious service and brought added honor to the profession by their qualities of leadership and spirit of sacrifice.

\$40,000 in war bonds are being offered to physician-artists (both in civilian and in military service) for art works best illustrating the above title. This contest is open to members of the American Physicians Art Association. For full details, write Dr. F. H. Redewill, secretary, Flood Building, San Francisco, California.

RICKETS PREVENTATIVE REQUIRES ONLY ONE CAPSULE A MONTH

Infron Pediatric—the result of important clinical research—introduced to the medical profession by Nutrition Research Laboratories, the manufacturers of Ertron, is especially prepared, highly purified electrically activated, vaporized ergosterol (Whittier process). The contents of one Infron capsule (100,000

USP units) is a sufficient dosage for one month, which greatly simplifies the administration problem. It may be mixed with the feeding formula, milk, fruit juice or water—or may be spread on cereal. Infron Pediatric is supplied in packages containing two vials, each vial containing three capsules. One package is a six months' supply.

Dr. Harry P. Browning has arrived in Terry from Indianola, Mississippi, to assume the management of the Good Samaritan hospital at Terry. Dr. Browning completed his medical studies at the University of Virginia and his internship in Brooklyn, New York and at the General hospital of Orlando, Florida.

At the 45th semi-annual meeting of the Montana Academy of Oto-ophthalmology, held in Butte, July 8 and 9, Dr. A. de Roeth, Spokane, Washington, spoke on hypofunction of the lacrimal gland and Sjögren's syndrome and on the value of sulfanilamide and penicillin in ophthalmology. Officers of the Academy are Geo. A. Lewis, M.D., Roundup, president, and F. D. Hurd, M.D., Great Falls, secretary. Annual meetings are held in February, the 1945 session having been at Butte and the 1946 meeting being scheduled for Billings.

Montana Health, Volume 1 Number 1 of which is issued under date of August, is the organ of the Public Health League of Montana, which includes among its member organizations the Montana State Medical association. The new publication printed the news of the July meeting of the medical association.

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The JOURNAL LANCET

Minneapolis, Minnesota
November, 1945

Vol. LXV, No. 11
New Series

Introductory Note to Symposium

S. Marx White, M.D.
Minneapolis, Minnesota

With this number the JOURNAL-LANCET presents a special heart issue. The idea was suggested to the editor by the late Dr. Mabel S. Ulrich, and at our request she secured most of the papers for it and had the editorial work on it nearly completed when her untimely death August eighteenth closed her career.

Dr. Mabel, as she was so often called to differentiate her from her distinguished husband, Dr. Henry Ulrich, served the medical, social, and cultural interests of Minnesota and the Northwest for approximately forty years. Her great abilities and the breadth of her interests and sympathies marked her from her first appearance in Minneapolis.

Her contributions to medicine, her publications for public education in medicine and hygiene, her service on the Minneapolis Board of Public Welfare when her type of service was greatly needed, and the years when every lover of books sought her counsel in Minneapolis, in Rochester or in Duluth, all added to her acclaim. One of her last services was to this journal and this edition. In the contributions in this number, the role played by modern surgery is indicated by Barnes in his consideration of patent ductus arteriosus and chronic constrictive pericarditis. Discussion of the more rare and still more dramatic procedures of removal of massive emboli from the pulmonary

artery and the surgical exposure with manual manipulation of the heart into renewed effective contraction in cases of ventricular fibrillation belongs elsewhere.

Gregg has a very readable synthesis of the factors in prognosis of coronary disease.

Goehl presents some notes for the general practitioner on the common cardiac irregularities.

Aagaard outlines the methods of determination of venous pressure and circulation time which should be practiced by everyone pretending to care for patients with heart disease.

Diamond recites the conditions under which a diagnosis of cardiac rupture in myocardial infarction is most likely to occur.

Ewald sketches the indications and contraindications for digitalis.

Shapiro's long experience at Lymanhurst gives him an unusually authoritative position when he writes on the treatment of rheumatic fever.

The JOURNAL-LANCET expresses high hope that the movement now on foot to establish at the University of Minnesota a heart hospital in which rheumatic disease in children can be studied will soon be consummated. This is the sort of activity in which Dr. Mabel Ulrich would have entered with enthusiasm, elan, and all the resources of her ardent nature.

The Consideration of Two Cardiac Diseases Amenable to Surgical Treatment

Arlie R. Barnes, M.D.[†]
Rochester, Minnesota

IT is useful at times to discuss some of the less common forms of heart disease. This is particularly appropriate since for some of these conditions curative procedures are available.

There are two minimal requirements for making the diagnosis of patent ductus arteriosus; the first is a continuous murmur over the pulmonary region and the second is roentgenographic evidence of enlargement of the

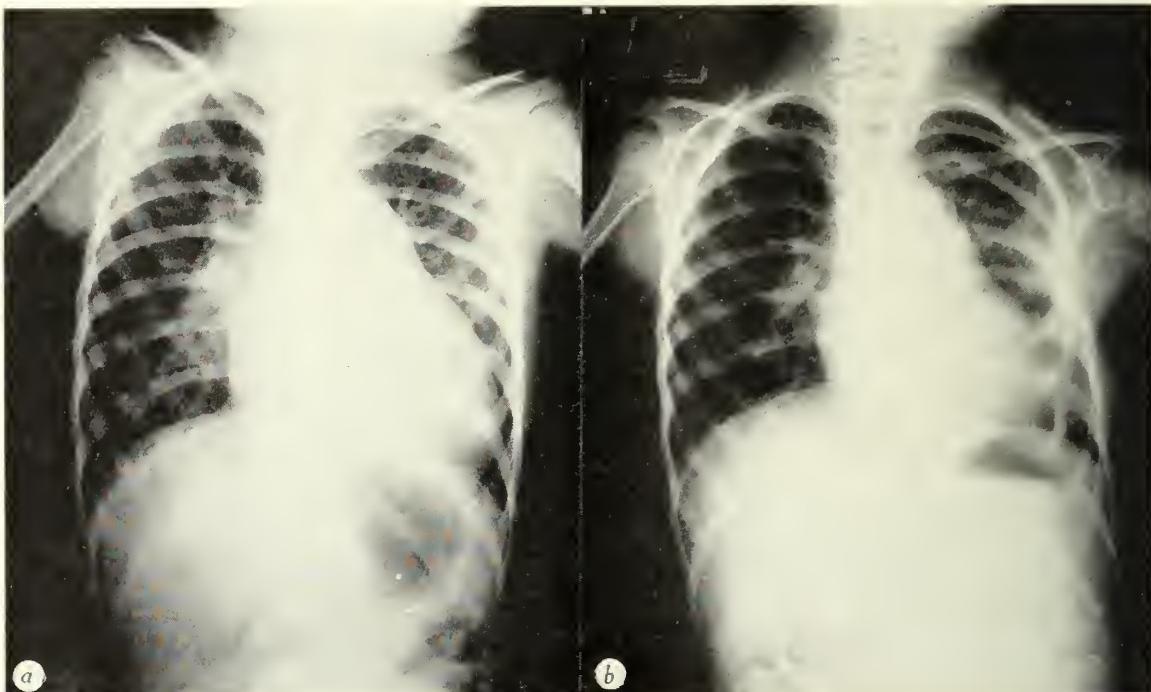


Fig. 1. Patent ductus arteriosus: (a) on admission there is cardiac enlargement with prominence of the pulmonary conus and bilateral hilar congestion; (b) one month after operation the size of the heart is reduced and the left pleura is somewhat thickened.

I. THE PATENT DUCTUS ARTERIOSUS

One of these cardiac conditions is patency of the ductus arteriosus. Patency of this structure in infancy and adolescence or young adult life may jeopardize the cardiac function seriously or greatly reduce life expectancy. Its effect on cardiac physiology is the same as that imposed by peripheral arteriovenous aneurysm. Blood flows through the patent ductus from the aorta to the pulmonary artery so that cyanosis is not present in uncomplicated cases. Of the blood pumped out by the left ventricle into the aorta 40 to 75 per cent passes back through the short circuit into the pulmonary artery.¹ As a consequence of this the left ventricle pumps from two to four times as much blood as the right ventricle in the same length of time. The consequent rise of the pulmonary arterial pressure and the fall of the peripheral diastolic blood pressure account in part for the increased

pulse pressure so characteristic of the patent ductus arteriosus.

pulmonary conus (fig. 1, a and b). The murmur has been described as machinery-like but it is essential that it be heard in diastole as well as in systole (fig. 2). A thrill may be felt at the point of greatest intensity of the murmur in about 75 to 80 per cent of cases.

The pulse pressure in cases of patent ductus arteriosus is greater than the average (normal pulse pressure 30 to 45 mm. of mercury).² Great caution in arriving at a diagnosis of patent ductus arteriosus must be observed in the absence of increased pulse pressure. Since patency of the ductus arteriosus produces both right and left ventricular hypertrophy, the electrocardiogram reveals no axis deviation or only slight deviation. Marked right axis deviation of the electrocardiogram suggests other congenital defects, such as a large defect of the interauricular septum or the tetralogy of Fallot.

Studies of the life expectancy of patients who have patent ductus arteriosus are interesting. In one series³

[†] Mayo Clinic.

*Presented before the Grand Forks District Medical Society, Grand Forks, North Dakota, October 17, 1945.

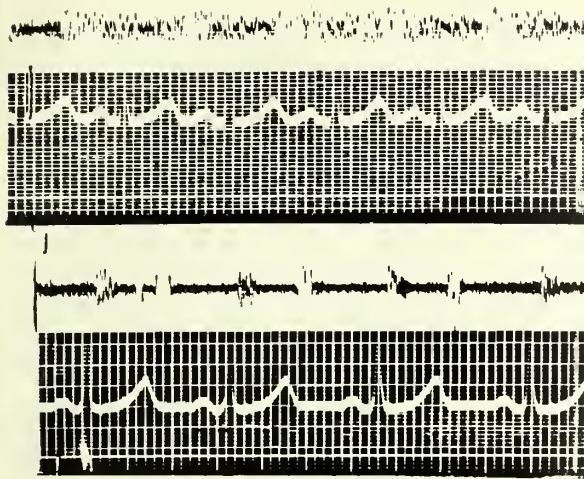


Fig. 2. Patent ductus arteriosus: phonocardiogram. Upper panel shows systolic and diastolic murmur before operation. Lower panel shows disappearance of systolic and diastolic murmur after operation.

in which no patient less than three years of age was included, 14 per cent of the patients were dead at fourteen years of age, 50 per cent at thirty years of age and 71 per cent were dead at forty years of age. Other investigators⁴ have concluded that this cardiac lesion reduces the life expectancy of males about twenty-three years and that of females about twenty-eight years. In this latter series subacute bacterial endocarditis accounted for 41.7 per cent of deaths and congestive heart failure for 28.3 per cent.

Indications for operation. Unquestioned indications for surgical closure of the patent ductus arteriosus include (1) uncompensation⁵ (indicated by lowered diastolic pressure, high pulse pressure, a collapsing pulse, an enlarging heart or by symptoms of increasing dyspnea) and (2) the presence of subacute bacterial endocarditis.

Differences of opinion arise about the indications for surgical closure in cases in which patency of the ductus arteriosus is compensated⁵; that is, in cases in which the diastolic pressure is normal or only slightly reduced and there is little or no cardiac hypertrophy and no peripheral signs of regurgitation. The earlier view in such cases has been that each case should be considered on its merits and that the patient should be observed for developments indicating a need for operation. However, if one reflects on the statistics of reduced life expectancy given in the previous paragraph, it is not easy to reach a decision that surgical closure in cases of compensated patent ductus arteriosus is not indicated.

Surgical closure of uncomplicated patent ductus arteriosus in the hands of a surgeon experienced in performing this procedure can be accomplished with a mortality rate of approximately 5 per cent. The surgical risk rises appreciably if subacute bacterial endocarditis is present but surgical closure of the duct still offers the patient the best prospect of complete recovery. Moreover, it is unwise to delay surgical treatment until a cure has been attempted with sulfonamides or antibiotic agents.

Successful closure of the duct produces a high percentage of permanent cures.

II. CHRONIC CONSTRICTIVE PERICARDITIS

Chronic constrictive pericarditis is another cardiac disease for which surgery offers a successful method of treatment. The disease is of uncertain and variable causation. Tuberculosis was demonstrated to be the cause in 21 per cent of our cases in which treatment was surgical.⁶ In many cases no antecedent history of any infection can be obtained. In a considerable number of cases a history of previous pulmonary infection is elicited but it rarely can be established that pericarditis was demonstrable at the time of the infection. It is generally agreed that rheumatic fever is not responsible for the condition.

It is generally accepted that chronic constrictive pericarditis is on an inflammatory basis comprised of fibrous adhesions, in some instances of deposits of calcium, and occasionally includes pockets of encapsulated fluid forming on or between the epicardium and the pericardium. This inflammatory scar may contract around the heart muscle to such a degree that it limits the diastolic filling of the heart, producing an inflow stasis. In consequence of this the venous pressure rises, edema and ascites result and the stroke volume and minute output of the heart are decreased. This latter effect results in a lowering of the blood pressure and an acceleration of the heart rate. Myocardial fixation to the scar and myocardial atrophy and degeneration from limited action of the heart as well as the effect of residual infection of the epicardial portion of the myocardium undoubtedly contribute something to the diminished force of the ventricular contractions.

Chronic constrictive pericarditis should come to mind whenever the examination of a patient who has edema, and particularly of one who has ascites, fails to reveal any cardiac lesion or enlargement. The term, "the small, silent heart," has been applied to describe the situation. While this designation is warranted in general, there are instances of cardiac enlargement in chronic constrictive pericarditis which are accounted for by encapsulation of fluid in the inflammatory mass about the heart or by pericardial thickening of considerable degree which completely envelops the heart. Since orthopnea occurs rarely, an important clue to the diagnosis is furnished by a patient who has marked ascites and edema but who is not dyspneic when he lies flat in bed.

Inspection reveals engorgement of the cervical veins, the veins of the arm do not collapse normally as the arm is raised above the level of the heart, cyanosis may be present but its degree does not appear to be in proportion to the other evidences of congestive failure and the apex beat may be scarcely visible. On auscultation the heart tones are likely to be faint, murmurs are absent and the heart rate is greater than normal or auricular fibrillation is present. The blood pressure usually is lower than normal unless the patient has hypertension.

Usually, the liver is considerably enlarged and dye tests of hepatic function commonly show much impairment of its function. For this reason the condition is often confused with cirrhosis of the liver. This doubt is quickly dispelled if the venous pressure is determined.

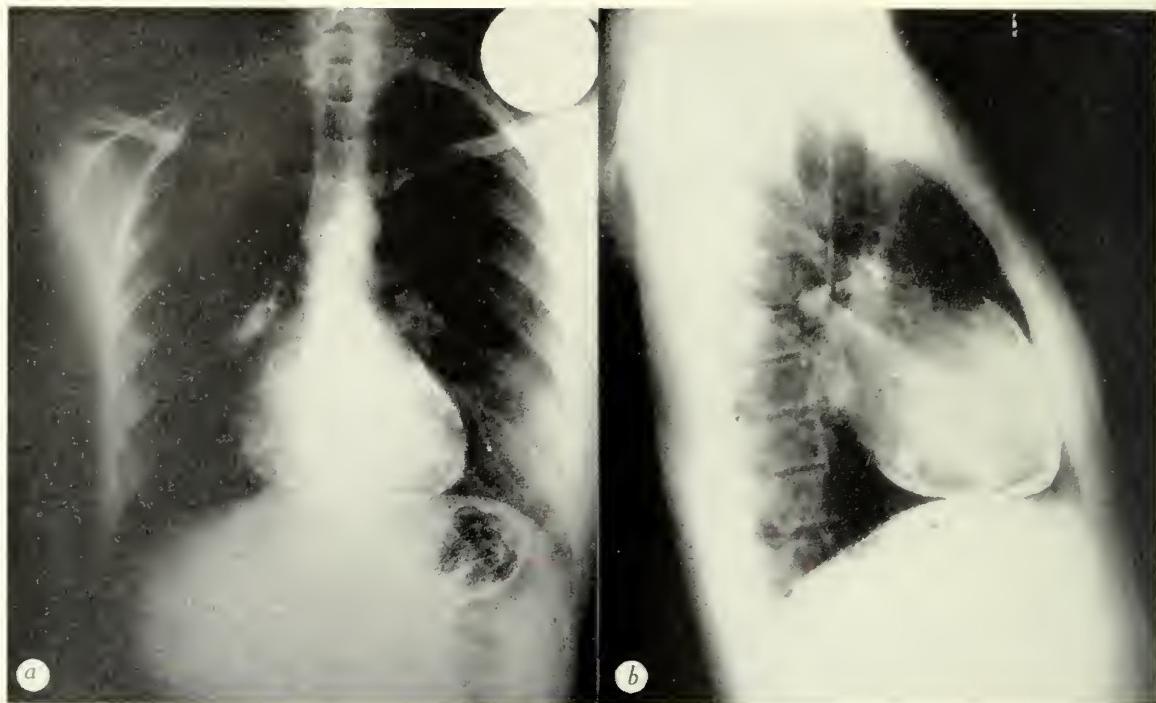


Fig. 3a and b. Pericardial calcification before operation in a case of constrictive pericarditis.

The venous pressure in cases of chronic constrictive pericarditis is markedly elevated. The exclusion of congestive heart failure due to other causes is established if evidences of valvular defects or of cardiac hypertrophy and dilatation are absent on physical examination.

The roentgenographic examination may be of value if, in addition to excluding cardiac enlargement, it demonstrates deposits of calcium in the pericardial area. Pericardial calcification was demonstrable in about 60 per cent of our cases (fig. 3).

While electrocardiographic changes pathognomonic of this condition cannot be claimed, yet there are changes that are strongly indicative of constrictive pericarditis (fig. 4). The electrocardiographic pattern which is most suggestive is one in which the QRS complexes are of low voltage (5 mm. or less) and T waves are negative in all standard leads. If the QRS complex is low in only one lead, that will usually be observed in lead I. The T waves in the standard leads may be of low voltage though upright. They may be iso-electric or may be inverted in only two leads. In precordial leads inversion of the T wave will be observed in most instances in which there is T wave inversion in the standard leads. The voltage of the QRS complexes in the precordial leads is impaired to a much less degree than it is in the standard leads.

Marked pericardial thickening, even including pericardial calcification, may exist without the occurrence of cardiac constriction. The diagnosis of cardiac constriction is justified only when the venous pressure is found to be elevated. Surgical intervention is not indicated unless evidence of cardiac constriction exists. Since the interference with cardiac function in cases of constrictive

pericarditis is essentially a mechanical one, the only permanent relief that can be afforded the patient is by the

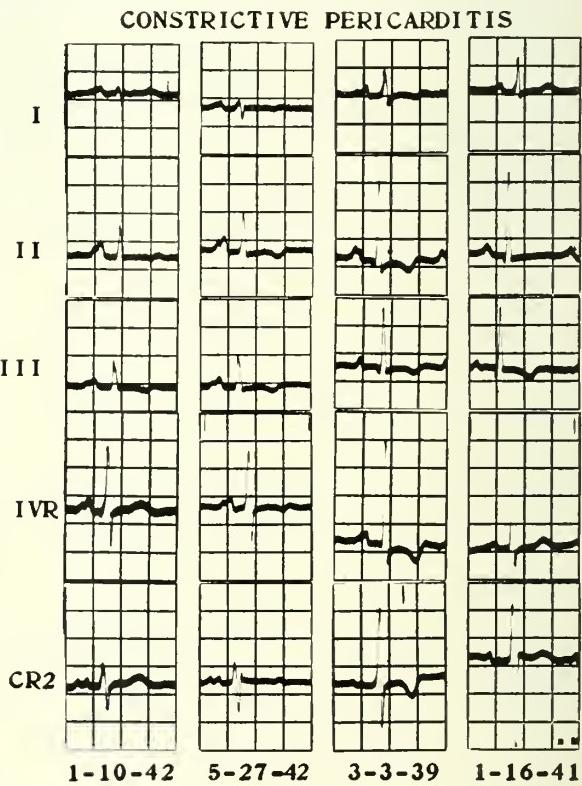


Fig. 4. Electrocardiograms of two patients before operation (columns 1 and 3) and of the same two patients after operation (columns 2 and 4).

surgical removal of this fibrous encasement. It is essential that the diagnosis be made as early as possible so that the extent of myocardial atrophy and degeneration and of hepatic impairment may be kept at a minimum. While the surgical risk is of the order of 25 per cent, yet it is not too high in view of the hopeless prognosis that confronts these patients without surgical treatment. Of those that survive, our experience⁶ has been that about half are completely restored to normal health and the remainder experience sufficient improvement to be well repaid for their operation.

Finally, these patients do not recover full cardiac function quickly after operation. The myocardial atrophy consequent on long impairment of cardiac contractility and the residual inflammation of the epicardial portion of the myocardium may require many months for complete resolution. But the satisfaction to be derived from

seeing these patients, who have been hopelessly crippled by heart disease, restored to a normal or nearly normal cardiac function is matched by no other results in the treatment of cardiac disorders that one is privileged to observe.

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Factors in Prognosis in Coronary Disease*

Harold W. Gregg, M.D., F.A.C.P.
Butte, Montana

IT has been said by Dr. Wm. D. Stroud¹ that "The subject of coronary insufficiency, coronary disease and angina pectoris should be a most interesting one, not only because the majority of the patients seen by a physician will sooner or later suffer with such a picture, but also because most physicians must expect to die with this condition. It therefore behooves us to learn as much as we can concerning its prevention and treatment."

This applies perhaps more particularly to this group here today, because all of us as internists find our practice as we grow older including more and more cases of heart disease, especially coronary disease. It is the disease of our present generation. Since the publication of Herrick in 1912,² in which he described coronary occlusion, long regarded as an occasional autopsy finding and in which he separated it from angina and firmly established the features of sudden obstruction of the coronary arteries as a clinically recognizable syndrome, the story of coronary thrombosis and coronary insufficiency has had many side lights. We have gone from an attitude of hopelessness to one of realistic optimism, without shutting our eyes to the fact that many of these cases die suddenly and that many more live for all too short a time. I have nothing new or original to propose but only wish in some small way to reaffirm this attitude of realistic optimism as regards coronary disease.

Again it may seem somewhat paradoxical to be urging optimism, when we know what a toll this disease is taking today. A good many physicians, however, have very personal reasons for taking an optimistic viewpoint. It helps them if they happen to be suffering from coronary disease to work out a satisfactory philosophy, and, after all, perhaps the most important thing in the treatment of coronary disease is to help our patients work out a

philosophy of life which will help them to live what years they have without fear, without dread and with some approach to normality. If we do not encourage them, many of them turn to cultists and refuse to do those things which may lengthen their comfortable years.

The remark of the head of one of America's large insurance companies which he recently made to a group of physicians is a case in point. "It seems to me that most of the people you advise us to reject for life insurance because of their hearts, act as pallbearers for the ones you tell us to accept." That is exaggerated, of course, but there is a measure of truth in it. It is only natural that a person who feels that he has some cardiovascular weakness is perhaps going to take better care of himself than the man who feels he is 100 per cent from a cardiovascular viewpoint, and the former may live longer than a person who thinks himself sound.

Sir James Mackenzie had his first substernal discomfort when he was 49 years old. When he was 67 he was playing his St. Andrews golf course in 84 and 86 when most of the men his age were playing it in 120. He died of coronary thrombosis at 73.

Dr. Wm. Thayer of Johns Hopkins had cardiac warnings for the last ten years of his life, but throughout that time carried on a large consultation practice.

It is perhaps more difficult in these days when doctors are coronary conscious and the patients are heart conscious, to get an unbiased history in coronary disease, and yet the little things in the history are so important. We may depend on the electrocardiogram for objective knowledge, but it still cannot take the place of a thorough painstaking history, even though this history may rest on a foundation of sand, since it does depend so much on the patient's personality. As patients have come to know so much about coronary disease and to fear it, this very fear is apt to color unconsciously their story to the doctor.

*Note: This paper was originally presented at the Montana, Wyoming, Regional Meeting of the American College of Physicians on May 1st, 1943, with charts and electrocardiographic tracings shown on the screen and with more cases discussed. Obviously limited space does not allow such presentation here.

As far as sudden death is concerned, our most recent statistics seem to indicate that only about 25 per cent of the people with coronary thrombosis die suddenly in their first attack. We know furthermore that if the actual danger period in coronary occlusion is passed safely, the mere fact of the coronary occlusion may not in itself appreciably alter the patient's expectation of life, although it does mean that the patient has coronary disease, which in turn means a guarded prognosis.

It is now known too, that the basis of coronary sclerosis and the manner in which it has developed are very important as regards acute coronary occlusion in determining life expectancy. And with this in mind, it may be wise to consider our whole subject on the basis of coronary insufficiency, which may be due to several causes, only one of which is typical coronary occlusion.

As Katz³ has succinctly stated the case, the fundamental causes of coronary insufficiency fall into four main groups:

1. Decrease in coronary flow.
2. Defects in the quality of the blood flowing in the coronary vessels, especially as regards oxygen content.
3. Increase in the work of the heart without equivalent increase in the coronary flow.
4. Hypertrophy of the heart not accompanied by increase in the capillary bed.

Whenever any of these factors are present, there are, of course, compensatory mechanisms which come into play, but they may not be strong enough to overcome the condition completely, and then we get the symptoms of coronary insufficiency. With this in mind it becomes so much more important in considering prognosis in coronary disease, to decide whether a given patient's coronary circulation is sufficient for the ordinary activities in which he indulges, than it is to even try to estimate the degree of anatomical change which is present in his coronary vessels.

There are many patients, we are sure, who have coronary disease even in rather advanced stages, who have no clinical signs or symptoms. Comparison of autopsy findings with clinical records and with the electrocardiogram sometimes shows marked anatomical findings in the coronary arteries without any clinical or electrocardiographic evidences. On the other hand many times there may be marked electrocardiographic changes and clinical evidences of coronary insufficiency without any apparent anatomical change being found at autopsy. This brings us again to the fact that all coronary disease should probably be considered from a functional viewpoint for the sake of prognosis at least, and to the realization that the autopsy findings alone do not reveal with accuracy in any given case the degree of coronary insufficiency during life.

The situation is comparable to that in advanced mitral stenosis. Many patients with mitral stenosis live rather comfortably for many years, but it is only when decompensation begins that we have serious signs and symptoms. With this in view, it is evident that whenever any area of the heart muscle is inadequately supplied with the proper amount and proper quality of blood, coronary insufficiency exists. Obviously the heart under some con-

ditions may have need for an increase in blood supply, under other conditions there may be an actual reduction in coronary flow. Either of these conditions means coronary insufficiency, and when such coronary insufficiency does exist it may lead to certain clinical signs and symptoms and electrocardiographic changes.

The ordinary anatomical examination of coronary arteries at autopsy cannot always be complete enough to show definite damage to some of the smaller branches. Present methods of injection obviate this difficulty to some extent. Further, a wide variation in the collateral circulation makes it impossible from anatomical examination to know just how much coronary insufficiency might have been present during life. As far as the symptoms of coronary damage go we know so little about the physiology of the sensory nerves of the heart that subjective findings are not always reliable. We do know that disease in the belly or chest, in organs that have segmental innervation associated with that of the heart, may aggravate symptoms of coronary insufficiency. It has been shown that anginal attacks may be produced in some people by temporarily cutting off part of the blood supply to the left forearm.

Then there is always the very important factor of the patient's personality makeup which must color the patient's history. So that, although the most common cause of coronary insufficiency is advanced coronary sclerosis, the two conditions cannot always be correlated. Whenever coronary insufficiency is present due to any cause, it eventually leads to local or generalized necrosis, degeneration, and finally fibrosis of the heart.

It is axiomatic that coronary insufficiency does not necessarily involve an absolute decrease in coronary flow or change in the composition of the blood. It means, rather, a coronary flow or blood composition which is relatively inadequate for the work the heart is called upon to do at a given time. What then, are the factors concerned in adjusting coronary flow to the need for that flow? When we have sclerosed coronary vessels we have a decrease in coronary flow. However, if the sclerosing process goes along slowly enough, collateral vessels may develop to keep pace with heart needs and we may have no insufficiency. This circulation may be aided by the Thebesian vessels as far as the auricles and right ventricle are concerned and throughout the heart by anastomotic connections from extracardiac sources.

Coronary insufficiency may occur in syphilitic aortitis due to the process around the mouth of the coronary arteries. It may occur in stenosis of the aortic valve for obvious reasons. It may occur again due to the markedly diminished diastolic pressure in aortic regurgitation, because the coronaries ordinarily fill during diastole. It may occur at any time the arterial pressure is suddenly lowered due to peripheral reasons, as in shock and vaso-motor collapse. Finally coronary insufficiency with its most dramatic manifestations may occur with embolic or thrombotic occlusion of the coronary arteries. The closure may be just as sudden through rupture of an atherosomatous plaque. There may be temporary insufficiency such as occurs in angina pectoris with spasm of the coronary vessels, sometimes in pulmonary embolism.

Coronary insufficiency may develop due to increased resistance to the emptying of the coronary blood. Large amounts of potassium salts, pitressin, and injections of foreign proteins may cause temporary vasoconstriction and thus coronary insufficiency.

As to the disturbances in the quality of the coronary blood, anemia is the chief offender. However, an anemia which is slowly developed is probably never more than a contributory cause in coronary insufficiency and may serve only to bring on symptoms in a case with otherwise symptomless coronary sclerosis. Decreased oxygenation of blood which is often present in pulmonary congestion, or even in emphysema, may cause marked temporary coronary insufficiency and may often be relieved dramatically by the administration of oxygen. Further, sudden increase in the work of the heart may bring on coronary insufficiency, because the coronary flow does not keep up with increase in work. These are the cases in which, to reduce the work of the heart, rest is absolutely essential. A fast or irregular heart is mechanically inefficient, thus in these cases quinidine or digitalis may be advisable.

I am sure that we have all seen cases in which cardiac hypertrophy results in coronary insufficiency since the coronary capillaries are not increased in number as the muscles increase in size.

In many of our chronic cardiac cases we see examples of coronary insufficiency in which the clinical signs and symptoms come on very rapidly and disappear quickly. These cases often show transitory precordial pain, marked dyspnoea and pulmonary edema, and may or may not show any electrocardiographic changes.

As a case in point I should like to report a case. A. J.—banker, age 70, without a hobby. On 3-29-34 gave a history that for six months he had mild shortness of breath. Had had what was called influenza five weeks before being seen. Since this attack he had had more shortness of breath—had had to slow down markedly on walking uphill. The past history had been insignificant except that for years he had had symptoms suggestive of duodenal ulcer, never proven. Today patient had marked air hunger and feeling of compression in chest. P.M.I. in the fifth interspace 9 cm. to the left of the nipple. Rough systolic murmur over the whole precordium transmitted to the axilla and the back. No lung or peripheral edema. Blood pressure 205/110. Advised bed rest. On 4-5-34 the patient suddenly had another spell of increased air hunger. Blood pressure suddenly changed to 198/0. Had no diastolic murmur. Had marked pistol-shot femoral sound and Corrigan pulse. The absolute diastolic and even the pistol-shot femoral disappeared in thirty days never to return. He had many spells of acute air hunger, of course, during the rest of his life. On 4-20-34 and 4-21-34 we were extremely fortunate to have the wonderful counsel and kindly advice of Dr. James B. Herrick on this case. During the early days of this man's illness an electrocardiogram showed no signs which we could interpret as suggestive of coronary occlusion. It did show definite myocardial damage and we knew that many of his symptoms were brought about by coronary insufficiency. During the eight years of his life after the first attack he had many attacks

(about twenty in all) of acute pulmonary edema, when, after some little extra exertion or some slightly increased emotional stress, he would develop marked air hunger and within two or three minutes would begin to cough and spit up bloody sputum. Both lung fields would show diffuse fine moist rales. On 4-1-35 he had what appeared to be a painless coronary thrombosis. And after this his cardiograms all showed much more marked myocardial damage, with bundle branch block. After the development of the bundle branch block, however, he lived over six years and withstood two attacks of severe bronchopneumonia in one year, the last attack coming in February of 1938. He exhibited, from the time of the thrombosis on, a rather marked emotional upset with extreme depression. I suppose that this depression, which is so characteristic of this type of case, is probably tied up with more or less chronic brain anoxemia.

The attacks of pulmonary edema in this case were of particular interest because of their very rapid onset and because of the fact that they responded so readily to rest, injections of morphine and atropine, and oxygen administration. The case was also especially interesting because this condition had developed in a man who had not learned to play and because of the emotional upset that was bound to come when the patient could not work.

These incidents of transitory coronary insufficiency typified by attacks of angina pectoris, cardiac asthma, and pulmonary edema occurring against a background of chronic or potential coronary insufficiency, may be brought on by excessive physical or emotional stress, by marked tachycardia or irregular heart action, by a very heavy meal, even by a sudden change in position, by movements or dreams occurring in sleep and by rapid ascents to high altitudes which often occur now since flying is so general, sometimes associated with heat stroke, and finally sometimes by massive hemorrhage or shock. In case of sudden death due to acute coronary insufficiency, however, occlusion of one of the arteries takes place quickly and death is usually due to ventricular fibrillation with sudden cardiac standstill.

In the protracted coronary insufficiency cases as described by Katz,³ we get the typical picture of an acute myocardial infarction. The occlusion in these cases is thrombotic, whether due to arteriosclerosis or to embolism, and infarction always occurs when the blood supply to a certain region of the heart has been cut down enough over a long enough period. If the cut-down of blood supply is less intense it must be present longer in order to produce infarction.

The amount of ischemia of the heart muscle depends in turn on how much obstruction there is, how much collateral circulation there is, on the composition of the blood, and on how much work the heart, especially that chamber of the heart, is having to do at the time. Sometimes, of course, collateral circulation is so good that complete occlusion can occur without infarction.

There are certain conditions which are confusing, which may give some clinical and electrocardiographic evidence of coronary insufficiency. Pulmonary embolism, at times pericarditis, wounds of the heart, dissecting

aneurysm, and paroxysmal rapid heart action are examples.

Often in these conditions an immediate differentiation between them and coronary thrombosis cannot be made either clinically or by means of the electrocardiograph, although there are usually enough clinical evidences to make the diagnosis possible even though the electrocardiogram is confusing.

Katz³ divides the chronic form of coronary insufficiency into non-progressive and progressive types. In the non-progressive form the insufficiency may be of any degree when first observed and it may progress very slowly or not at all throughout the years. The prognosis of these cases is good unless for some reason we get an acute myocardial infarction or a sudden fatal attack of coronary insufficiency. Sometimes after a coronary closure compensatory factors come into play and we may have a chronic coronary insufficiency in an arrested form.

Another case in point as regards prognosis is that of another banker without a hobby, age 61. On 8-1-37 he was awakened out of his sleep with sudden severe pain in the upper epigastrium, radiating to the apex. On the next day his blood pressure was 136/88, blood count: whites 18,200 with polys 88 per cent. Temperature R 102. Electrocardiograms of this period show signs of acute coronary thrombosis with marked changes in the first and fourth leads. In the electrocardiogram on 1-5-38 the changes in the first lead had already disappeared, leaving only the fourth lead changes as electrocardiographic evidence of his disease.

This man, in spite of contrary advice, has worked almost every day since three weeks after his original insult and is still doing very well in spite of not taking care of himself very well. These cases of coronary insufficiency may have to have watchful care over a period of years and careful, intelligent medical care in these cases may preserve many men and women for their families and their work for several years during the prime of life and thus pay such dividends as does no other medical care which we can give. This sort of coronary insufficiency may also appear very silently in such diseases as diabetes, hypertension, and obesity.

The progressive type of coronary insufficiency, however, shows rather rapid changes. The disease of the vessels may develop rapidly and the compensatory factors may be slow in getting to work and these cases usually have early death.

When we have cases of acute myocardial infarction which are not on the basis of chronic coronary insufficiency we may keep them at rest for six weeks to three months, with the result that many of them may be said to have obtained for all practical purposes, a cure. They must be careful, of course, as to prolonged physical or emotional stress for the rest of their lives, but many of them may even carry on their profession actively, and may even indulge to a limited degree in some of the less violent sports.

All of this leads us to the conclusions which are backed by the bulk of statistics, that while coronary thrombosis is always a serious condition, prompt diagnosis and treatment may result in a good many recoveries, especially if the first attack occurs before the age of 60.

Conner and Holt⁴ studied 287 cases of coronary thrombosis over varying periods at the New York Hospital, Cornell Clinic, and in their private practices and at the time of their report 117 out of 287 were known to be alive, 142 had died, and 28 were untraced. Out of the 117 cases surviving the first attack, 75 per cent were alive and in good health at the end of one year, 56 per cent at the end of two years, 42 per cent at the end of three years, 34 per cent at the end of four years, 21 per cent at the end of five years, two cases living at the end of twelve years and one at the end of seventeen years. Twenty per cent of those who survived the first attack enjoyed good health for more than five years.

In White's and Bland's⁵ 200 cases of coronary thrombosis, 16.2 per cent lived four years or more.

Levine⁶ on the other hand found an immediate mortality of about 50 per cent. The average age of those who recovered was 54.7 years. The average of those who died in the first attack was 61 years. Perhaps the younger patients are a little more apt to recover.

Willus⁷ of Rochester, reporting on the after history of 370 patients with coronary thrombosis who were seen at the Mayo Clinic, said that at the time of the report 45.7 per cent were alive and 54.3 per cent dead. Of these deaths all but 10 were due to some cardiac involvement. Of the 169 living cases and the 190 fatal cases who had a cardiac death, 77 per cent lived for one year or more, 67 per cent two years or more, 57 per cent three years or more, 41 per cent four years or more, 26 per cent five years or more, 5 per cent ten years or more, 1 per cent fifteen years or more.

Coronary disease is probably on the actual increase and in spite of our optimism it has a serious morbidity. It attacks most often between 40 and 60, the prime of life. In our own country it seems to have certain geographical incidence with above average death rates in New England and Middle Atlantic and along the Pacific coast states. Body build may play some role, occupation probably does not, although what statistics are available seem to indicate that foremen and skilled workers have a higher percentage rate than do even professional men.⁸

The immediate prognosis is grave. Prompt discovery and proper treatment of these cases may restore many persons, even with the severest initial symptoms, to reasonable health and usefulness.

As to further etiology of coronary insufficiency, or of the factors that may contribute to coronary insufficiency, the late Stuart Roberts in 1931 wrote: "We call a syndrome angina pectoris, or essential hypertension, or nervous indigestion, but in reality it can be explained on the basis of spasm of the muscles in different systems. It does not depend primarily upon an organic or cellular pathology of that system but rather upon the spasmogenic aptitude and constitution of the individual. As the gear of the nervous system, so is the presence or absence of spasm." He goes on to compare the white man's life with its stress and strife with the southern Negro's life, unhurried, unworried as it may be. However, there have been some statistics recently published showing that perhaps the Negro, even with his slow, happy-go-lucky disposition, has as much coronary disease as do white folks; that the matter is individual and not racial. We have all

by now heard the story told by Dr. Howard Sprague who met the Negress who was over 102 years of age and her explanation of how she had lived so long; that when she sat, she sat loose. Perhaps that is the answer for the average angina patient; to learn the philosophy of life which makes him when he sits, to sit loose.

The largest incidence of coronary disease seems to be in the sixth decade with the peak around 57, but more and more we are finding cases in the fifth, fourth, and third decades.

As to some of the factors in etiology which I think we might consider and which are important to us in thinking of prognosis, we must first consider heredity. It has been pretty well proven that there are certain families with a history of degenerative type of cardiovascular disease, in which the individual is born with an hyperirritable vaso-motor system. In other words, who have what has been called a spasmogenic aptitude, or who lack, as (Sir William) Osler put it, the proper tubin. If in our care of families we can reasonably convince ourselves that we have a child who is a potential coronary case we may be able to help him steer clear of some of the other etiological factors which might develop his aptitude.

Whether frequent streptococcus infections in early life play a part in the development of arteriosclerosis, no one knows. There is some basis for this possibility in the pathological picture of the coronary arteries which we sometimes encounter in children who die of rheumatic heart disease in the first ten years of life.

As to the effect of diet, I do not believe anyone knows what its relation is to hypertension and arteriosclerosis. There is no evidence that the amount of salt in the diet has very much to do with these cases except in the presence of edema. The more or less recently acclaimed low protein diet is probably not only of no value, but may be harmful because it may help increase the permeability of the capillary walls and thus contribute to heart failure with edema. The effect of intestinal stasis may be important; I do not know.

As to the effect of alcohol and tobacco, White and Sharber⁹ studied 1500 private cases with special reference to the effect of alcohol and tobacco as regards angina pectoris. They studied 750 cases with angina pectoris and 750 without. Both groups were of the same sex and same walks of life. The comparison showed that 46.1 per cent of the anginal patients had been abstainers from tobacco while 24.4 per cent had used tobacco to excess. Thirty-seven per cent of the control series did not smoke and 33.5 smoked excessively. Total abstinence from alcohol was the history in 64.4 per cent of the angina patients and in 61.7 per cent of the controls. Only 8 cases, or 1.1 per cent of the angina cases drank considerable or excessive alcohol and only one drank very heavily, while 63 individuals, or 8.4 per cent of the control series, drank much alcohol, 4 of them very heavily. So that it appears that neither the use nor the abstinence from either tobacco or alcohol plays an important role in angina pectoris. In occasional cases tobacco apparently aggravates or precipitates attacks of angina pectoris and in an occasional case alcohol helps relieve such attacks.

Perhaps one of the most important factors is obesity. Many hypertensives can reduce their blood pressure

markedly by simply reducing their weight. Many of these people who have anginal attacks seem to have fewer attacks as their weight is reduced. People who are overweight are much more apt to develop diabetes and, of course, the relation of diabetes and arteriosclerosis is well known. However, since the heart muscle depends to a great extent on glycogen for its nutrition, one must be careful in reducing the blood sugar in patients with diabetes who also have coronary insufficiency. We all have patients under our care in whom we can bring on typical anginal attacks by reducing their blood sugar below a high normal. It does not need to be low enough to cause a severe insulin reaction.

Whether excessive effort is of much importance as a causative factor in arterial disease is a question. Why do so many crack athletes die in their fifties and sixties due to some cardiovascular disease? Perhaps they have that spasmogenic aptitude which makes them good athletes and they may die at about the same age whether or not they took part in athletics. Then as to some of the most important factors, we must consider emotional stress, mental concentration without adequate relief and too few vacations: i. e., the stress and strain of modern life. We must remember the number of prominent business men who died from coronary disease at the beginning of the depression in 1929. We can speak very glibly of the stress and strain of modern life being a factor, but I do not believe anyone knows the mechanism, nor does anyone know why the stress of war should be a causative factor in coronary disease.

As to the relation of coronary disease to upper belly disease, we do know that many attacks of coronary thrombosis were mistaken in the past for gallbladder disease. Today the pendulum has swung the other way, and perhaps we are neglecting some cases of gallbladder disease on a basis of coronary diagnosis. It must be remembered that the two conditions are often associated and that many times removal of a badly infected gallbladder will definitely improve the signs and symptoms of coronary insufficiency. The digestive aspects of coronary occlusion have become so impressed on the mind of physician and laymen that many abdominal conditions are sometimes today mistakenly labeled coronary heart disease.

All in all, no single condition in clinical medicine presents a more difficult problem in prognosis than coronary heart disease. Except in advanced cases it is very often difficult to gauge the extent of the damage. All of us have seen patients for whom the outlook appeared hopeless, who, after a long period of rest, have regained a fair measure of cardiac reserve and have resumed a reasonably active life. On the other hand, there are those patients, often the younger ones, with minimal signs and symptoms who die suddenly and unexpectedly. There is as yet no satisfactory clinical test which will measure the functional potentialities of the coronary circulation, or even that of the myocardium itself.

If, in an individual with cardiac pain, the physical examination of the heart, the blood pressure, and the electrocardiogram are all normal, the outlook should be reasonably favorable. This is born out with statistics by the studies of Paul White and Bland⁵ who reported in 1942

on the prognosis of 500 cases of angina pectoris and 200 cases of coronary thrombosis. The future of a patient with coronary heart disease depends in a measure on his ability and willingness to live within the limits of his cardiac reserve, and in part upon his emotional makeup. Of course it goes without saying that it depends too, on intelligent, sympathetic and kindly medical care.

Our conception of the outlook of the patient with coronary thrombosis has altered materially since Herrick's^{2,10} papers in 1912 and 1919. He first referred to the milder cases and said that in some instances a complete (that is, a functionally complete) recovery ensues.

Thayer¹¹ in 1923 wrote, and was one of the first to write with our present guarded optimism, "It must be recognized that coronary occlusion grave enough to result in extensive infarction of the heart wall with all its sequels, may be compensated for to such a degree as to be followed by years of relatively active life, provided that at the onset the heart be spared all strain, and that thereafter the life be properly regulated." Happily a good many cases follow this dictum, especially those in the younger group. The infarction becomes a firmly healed scar and some are even able to engage in sports such as golf, swimming and horseback riding.

There remain to be discussed very briefly the complications of coronary occlusion both during the acute stage and the later stages which affect prognosis. In the acute stage, they are:

1. Sudden death, usually due to ventricular fibrillation.
2. Left ventricular failure, manifested by
 - (a) Gallop rhythm
 - (b) Dyspnea and orthopnea
 - (c) Pulmonary congestion
 - (d) Cheyne-Stokes respiration
 - (e) Pulsus alternans
3. Rupture of the infarcted area of myocardium, three days to four weeks after thrombosis.
4. Cardiac arrhythmias, of which the most important is ventricular fibrillation; and embolic phenomena.

Later complications are:

1. Left ventricular failure, followed by right ventricular failure.
2. Recurrent attacks of angina pectoris.
3. Recurrent episodes of coronary thrombosis.
4. Aneurysmal dilation of left ventricle.

CORRECTION

Through one of those unaccountable oversights that occur every so often notwithstanding vigilance, the excellent paper of Dr. W. G. Richards, "Body Minerals," that appeared in the September issue of JOURNAL-LANCET, gave Dr. Richards' address incorrectly as Grand Forks, North Dakota. Dr. Richards is a member of the Yellowstone Valley Medical society and resides at Billings, Montana, and it was through no fault of his that he was seemingly moved into another state by mistake.

Although it is not within the scope of this paper to discuss treatment, a very short outline of the treatment of coronary thrombosis with treatment of complications may be in order.

1. Relief of pain, by morphine and atropine.
2. If collapse and unconsciousness, adrenalin, caffeine, or coramine. Unless there is collapse these are contraindicated.
3. If shock, concentrated glucose intravenously.
4. Oxygen.
5. Some men use routinely aminophyllin intravenously, value probably questionable.
6. Diet, liquids in small amounts for the first few days.
7. Most important, complete physical and mental rest.

Treatment of complications:

1. Quinidine for paroxysmal ventricular tachycardia. Dose: gr. 1½ to gr. 2 followed in 2 hours by gr. 3, then gr. 5 every 2 hours until abnormal rhythm abolished. Not more than six 5-grain doses at 2-hour intervals.
2. Auricular fibrillation if persistent may need digitalis. Digitalis in general contraindicated during the first two weeks. Congestive failure better treated by mercurial diuretics.
3. If heart block, adrenalin with caution.
4. Care in use of insulin in diabetics.

Most important of all, however, is the understanding care of the physician who is scientist enough to believe in and practice with all his skill the art of medicine.

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ADDITION

New members of the Montana State Medical association added since the publishing of the roster in October JOURNAL-LANCET are Dr. Edythe Boyd, Whitefish; Dr. Neil Leitch, Kalispell; Dr. J. H. Brancamp, Butte; Dr. R. C. Richardson, Butte. Dr. Richardson completed his fellowship in ophthalmology at Colorado General hospital, Denver, and has become associated with the Murray clinic at Butte. He will limit his practice to his specialty.

Management of the Common Cardiac Irregularities*

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DISTURBANCES in the rate and rhythm of the heart are frequent. They are many times mismanaged, probably due to failure fully to appreciate the factors involved. Because of this, I believe such a discussion as follows is always a timely subject. Cardiac arrhythmia, or irregularity in the heart's action, occurs when the sinus rhythm is disturbed, when impulses arise in other localities than the sinus node for one or more beats or when there are disturbances in the transmission of the impulse.¹ The significance of each type of arrhythmia depends on the circumstances under which it occurs and the clinical condition of the patient in whom it is observed. The more widespread use of the electrocardiogram has led to new interest and accuracy in the diagnosis of these conditions. Yet, as Sir James MacKenzie said, "The eventual use of machines in diagnosis is to teach us how to do without them."

There is little doubt in my mind but that the large majority of cardiac irregularities can be diagnosed from the history and physical examination alone. In most instances the arrhythmia will be one of the four most common types, namely, (1) sinus tachycardia, (2) premature contractions, (3) paroxysmal tachycardia, and (4) auricular fibrillation. It is primarily these four conditions that I wish to discuss in this paper. Each may usually be diagnosed from the history and physical examination with the possible exception of those cases in which the diagram becomes confused between extrasystoles and fibrillation, when it is sometimes necessary to resort to the electrocardiogram to determine the condition.

SINUS NODE IRREGULARITIES

The sinus node irregularities in general compose a benign group consisting of the respiratory arrhythmia, the bradycardia and the tachycardia. This respiratory arrhythmia usually results from the action of the vagus on the sino-auricular node. It occurs most frequently in children and young adults and its main importance lies in its differentiation from other arrhythmias. It is accentuated by deep breathing (thus aiding in diagnosis).² Sinus bradycardia is a term which designates a slow rhythm with a rate below 60 and in itself has no clinical significance. Sinus tachycardia, however, may frequently produce a problem which taxes the physician's patience and resourcefulness. Arbitrarily, any sinus rate above 100 in an adult is considered a sinus tachycardia. It usually results from a disturbance of the tonal control of the cardiac nerves or possibly from some changes of the blood supplying the sinus node. Many physiologic and organic conditions will cause this accelerated heart rate, but it is the nervous type which I wish to discuss further.

Names such as psychogenic complex, cardiac neurosis, anxiety neurosis, neurocirculatory asthenia³ are used to describe this syndrome when it is associated with annoying subjective symptoms. Palpitation is the most common

symptom, but restlessness, agitation, breathlessness, and precordial pain may be present. These patients do not have organic heart disease, but their disturbed cardiac regulatory mechanism is only one factor in their general autonomic imbalance. They may be the shy, selfconscious type of individual with a history of nervous indigestion, irritable colon, and other functional manifestations. Because of the nervous picture which these patients present they are sometimes misdiagnosed and treated as suffering from hyperthyroidism.

Treatment of this group of sinus tachycardias is difficult, but I believe much can be accomplished by extreme patience and assurance. Too often the psychogenic makeup of a young adult is not sufficiently evaluated before a course of cardiac management is begun, and, as a result, the anxiety complex continues or is exaggerated. In these cases some medications for a short period or interrupted periods are of value. Sedatives are most useful in this condition, and perhaps the barbiturates are least complicating. Phenobarbital in $\frac{1}{4}$ or $\frac{1}{3}$ grain doses with or without quinidine three times daily is sometimes of benefit. Also antispasmodic drugs such as Ciba's trasetin, Searle's pavatrine, novatropine and belladonna combined with sedatives are beneficial for a short course of treatment. Digitalis does not seem to be of any benefit in this type of case. In women during the menopause it is not uncommon to have a sinus tachycardia which produces subjective symptoms. This condition will usually respond well to estrogenic therapy.

PREMATURE CONTRACTIONS

Premature contractions, or extra systoles as they are often called, are frequently seen in both normal and diseased hearts. These ectopic contractions may arise from any portion of the heart muscle or conduction tissue. As a rule, the premature beat replaces the next ventricular contraction, the ventricular muscle being in the refractory stage when the next regular stimulus reaches it. This compensatory pause is characteristic of premature beats, though it may not be of complete length in the auricular type where the pacemaker is disturbed.

The history of the patient complaining of a "flopping" or "jumping" or "turning over" sensation in the cardiac area makes the diagnosis of extra-systoles suspicious. They are more apt to occur when the heart rate is slow, and on auscultation the regular rhythm is broken by an audible premature beat, followed by a brief pause. The sound of the premature beat is often characterized by one tone when the contraction is too weak to open the aortic valves. Coincident palpation of the pulse reveals no wave or one of diminished volume.

It must be remembered that one of the most valuable signs of digitalis intoxication in a patient with normal rhythm is the appearance of premature beats. Sometimes a coupling with premature contractions may occur in patients with severe myocardial damage. It is in this type

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of patient that the margin of safety between the therapeutic and toxic dose of digitalis is narrowed. The appearance of this rhythm in a patient receiving digitalis indicates immediate cessation of the drug. The frequent occurrence of premature beats in a patient with fairly rapid heart rate may be quite difficult to distinguish from auricular fibrillation. In both there may be present an irregularity of force and rhythm of the pulse with a pulse deficit. Mild exertion to accelerate the pulse rate will sometimes temporarily stop the irregularity if it is due to extra-systoles, if to fibrillation the irregularity will continue. Frequent, careful examination of the patient will usually differentiate the two, although an electrocardiogram may be necessary.

In the management of the patient with extra-systoles, it is again of great importance that we give unqualified assurance to those who have no evidence of organic heart disease. (This comment reminds me of a female patient, whom I have had under my care for the past several years, and the relating of her case briefly will help to emphasize this point. She is now 72 years of age and has had premature beats for the past thirty years. At the onset of this condition she was led to believe that she had a "bad heart." This has continued for some thirty years, and she is still in quite good physical condition.) Sometimes the etiological factor in premature contractions is quite simple and easily removed if located. The combination of fatigue, worry, and increased use of tobacco is a common cause. Foci of infection such as apical abscesses of the teeth and cholecystitis are responsible for some cases. In those patients with irritable hearts having frequent premature beats and periods of tachycardia the use of quinidine and phenobarbital may be indicated. Infectious diseases, especially pneumonia, often show premature beats at some time during their course, but no special therapy is indicated in most of these cases.

In patients with organic heart disease the presence of frequent extra-systoles, especially if the heart rate is elevated, suggests an active myocardial affection. When premature beats appear after coronary occlusion, it may be a warning of an impending ventricular fibrillation. The use of quinidine, 3 grains every four hours, is rational therapy to reduce the irritability of the ventricular musculature and lessen the possibility of this fatal rhythm. The appearance of premature beats during digitalization indicates caution. Occurring in a patient with heart disease, who has received no digitalis, the drug should be given if there are signs of myocardial insufficiency. In these cases the irregularity may lessen or disappear with digitalization.

PAROXYSMAL TACHYCARDIAS

Paroxysmal tachycardias are chiefly recognized by their sudden onset and termination, and their great regularity. We will concern ourselves here primarily with the auricular and nodal varieties which are most common and usually occur in otherwise normal hearts. (Paroxysmal tachycardia of ventricular origin is usually associated with organic heart disease.)⁴ Attacks of supraventricular paroxysmal tachycardia may be of a few minutes to a few days in duration and may occur at all ages, most fre-

quently in young adults. Relatively few attacks are seen by physicians, because they usually cease spontaneously or are stopped by methods patients have learned to adopt. Some attacks, however, may become quite serious, if prolonged, and may produce complications such as hemiplegia, thrombotic sequelae, and cardiac failure.

Many attacks of this condition require no treatment, but in the more severe episodes, the patient is greatly distressed by the pounding, choking type of heart action and several methods may need to be attempted before the attack is stopped. All methods of treatment depend upon the same principle—stimulation of the vagus. Patients who have had experience with these attacks are already familiar with such procedures as a forcible attempt to expire, induced vomiting, carotid sinus pressure, and pressure on the eyeballs. (If not, it may be well to instruct uninformed patients in these methods.) It is recognized that the psychic factor may be a powerful one.⁵ It may act as a direct precipitating factor for attacks, and even a person in good health may develop a disabling neurosis from distorted notions as to the significance and outlook of this disorder. This, of course, may be true of many cardiac conditions; therefore reassurance must be definite and backed by proved ability to terminate attacks as promised.

If drugs are indicated because of repeated attacks which greatly annoy the patient then quinidine is the best and may be given in 3 to 5 grain doses two, three, or four times daily. It will be found that an occasional patient responds better to digitalis given in subdigitalizing dosage. Also sedatives such as the bromides and phenobarbital used alternately are helpful. Here again, the nervous irritability associated with the climacteric may be contributing to the recurrence of attacks. If such is the case, estrogenic therapy may be all that is needed to control the situation. If the attack itself persists in spite of the usual physical methods, then active medical treatment must be instituted, and quinidine sulfate is the first in line. It should be given in 3-grain doses every two or three hours, after a single initial dose to test for sensitivity to the drug. This dose may be increased in twelve to twenty-four hours if the attack has not ceased.

During the past year, 1943, Sturnick and his associates have reported experience in the use of a soluble preparation of quinidine suitable for parenteral administration in treating the cardiac arrhythmias.⁶ They indicate excellent results in the treatment of paroxysmal tachycardia with this preparation; however Morgan⁵ in his recent summary of the situation indicates that there is still some question of safety in this method—time will tell. Personally, I have never resorted to intravenous quinidine in this condition, for I have found the use of mecholyl (acetyl-beta-methylcholine) more practical and quite satisfactory in the few cases that do not respond to oral quinidine or physical measures. It is of importance to state that this drug should be used with much caution because of the possibility of adverse side effects, such as a marked flushed feeling, profuse perspiration and salivation, and audible peristalsis. The average dose of mecholyl is 10 to 50 mg. given subcutaneously. It is well to give a small dose and repeat it in twenty to thirty min-

utes if the heart rate does not become normal. Atropine gr. 1/75 to 1/100 is very effective in controlling the action of mecholyl, and it should be ready in an alternate syringe before starting this treatment. No deaths have been reported from the use of this drug,⁵ and it is now council accepted for this purpose.

AURICULAR FIBRILLATION

Auricular fibrillation may be said to be the most frequent and the most persistent of all arrhythmias, and it is easily the most important of the cardiac disturbances of rhythm. The ventricles are bombarded by the numerous small stimuli from the muscle fiber contractions of the auricles, and because of the refractory period of the bundle of His, only a portion of these pass through to the ventricles. This usually results in a heart rate continuously above 120 per minute and totally irregular in force and rhythm. As the heart rate increases the pulse rate becomes relatively less, because of the greater pulse deficit. Occasionally, auricular fibrillation occurs in short paroxysms in individuals with no demonstrable heart disease. These attacks are likely to follow indiscretions in eating or drinking and accompany severe fatigue and over-exertion. If they do not subside spontaneously within a short time, as they usually do, quinidine and not digitalis is the drug to be used.⁷ Etiologically, most cases of auricular fibrillation are associated with rheumatic heart disease or degenerative heart disease, and most of them below the age of 40 are due to mitral stenosis.

Of great aid in diagnosis is the discrepancy in the apex rate and the number of impulses palpated at the wrist; also, in taking the blood pressure one will notice no regular upper level of systolic pressure, but rather an irregular group of beats are heard at different systolic levels. With a rate of about 70 or 80 per minute it is easily mistaken for sinus arrhythmia, premature beats, or even normal rhythm. An error here is not of too much importance, because no specific treatment is necessary; however, digitalis should not be stopped because the rhythm "seems nearly regular and of normal rate."

Congestive heart failure is often present in patients with auricular fibrillation, and if it is the first break in compensation, satisfactory results may be accomplished by such measures as bed rest, light diet, limitation of fluid intake and securing sleep with morphine hypodermically. I have many times noticed this effect and have thus postponed the time when digitalis was necessary.

It must be remembered that in auricular fibrillation we find the most striking results of digitalis therapy; however, all cases of this irregularity do not indicate digitalis. We find that the younger rheumatic type of heart disease will respond much better than the older arteriosclerotic one. I have many times been disappointed in the results obtained in elderly patients by the use of digitalis, which, I believe, is an important point to keep in mind with our increasing number of older cardiac patients.

I wish to mention a few other suggestions in the use of this important cardiac drug. Digitalis is contraindicated in paroxysmal auricular fibrillation because it tends to fix the abnormal mechanism and to prolong the par-

oxysm.⁸ Digitalis preparations vary in their potency and in their degree of absorption, therefore, it is important to be familiar with the product used. Digitalis should not be used in pneumonia or acute infections unless a basic cardiac indication is originally present. The slow oral method of supplying digitalis to a patient is usually sufficiently effective, and when the intravenous route is used, the dosage is less.

Quinidine sulphate is a valuable drug in the treatment of certain patients with auricular fibrillation. It decreases cardiac irritability and tone and when successful it restores in the auricles a normal sinus rhythm. The ideal cases for this form of therapy are those in which there is not much evidence of heart disease other than the fibrillation, and where the fibrillation has been of short duration (under six months). In using quinidine to terminate auricular fibrillation it is wise to digitalize the patient first and then to proceed with quinidine about as one would in the above paroxysmal tachycardia. Deaths occurring after quinidine therapy are very uncommon when the cases are properly chosen.

GENERAL COMMENT

Cardiac arrhythmias often cause a great deal of concern to the surgeon, although they are seldom too serious. The one serious one, as far as risk is concerned, is that of complete heart block of organic nature. Auricular fibrillation in itself is not a contraindication to surgery, providing that it is properly controlled beforehand. Butler, Treeney and Levine⁹ gave the mortality risk as 3 per cent. Extra-systoles have no significance unless when accompanied by other findings of advanced heart disease. History of paroxysmal tachycardia does not contraindicate surgery.

In the prognosis of arrhythmias, it is essential to be certain of the exact condition with which we are dealing. If, after thorough physical and clinical evaluation, there still exists an element of doubt, the electrocardiogram will be very helpful in offering information of prognostic value. As Borg¹⁰ has stated in a recent discussion of this subject, "Experience teaches that one must always be guarded in the expression of prognosis, a hazardous matter at best, but electrocardiographic findings will often enable the inquiring physician to evaluate more accurately the risk the patient is carrying and to forecast a course of events otherwise unsuspected."

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Objective Tests of Cardiac Function

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THE purpose of this paper is to emphasize the usefulness and simplicity of two objective findings in the study of the cardiac patient. These are the measurement of the systemic venous pressure and the circulation time.

VENOUS PRESSURE

A common finding in the patient suffering from congestive heart failure is the markedly distended peripheral venous system. When the increase in the venous pressure is marked the venous distention may be obvious to even the casual observer. However, a method of detecting small increases in venous pressure is desirable.

Non-instrumental methods of estimating venous pressure are often useful in emergencies when the necessary equipment is not immediately available. One of these is carried out as follows: with the patient relaxed in the supine position the arm is slowly elevated and the level at which the anti-cubital vein collapses is noted. The zero point is taken as a point 5 cm. posterior to the junction of the fourth rib with the sternum. The distance from the zero point to the level at which the vein collapses is the venous pressure and should normally be in the range from 3 to 10 cm. Disadvantages of this method are: the veins in obese patients may not be readily visible; the veins in older patients may be so thick-walled that they do not collapse sufficiently to give a good endpoint.

Another non-instrumental method of estimating venous pressure has been suggested by Lewis.⁶ The level of the column of blood in the jugular veins in normal humans does not rise above a horizontal plane passing through the manubrium sternum. Distention of the cervical veins above this level represents an abnormal elevation of the venous pressure. This method has a shortcoming similar to that noted above, in that it is not practicable in patients with obesity or deeply placed cervical veins.

Many instrumental methods of measuring venous pressure have been described. This discussion will be limited to the direct method of Moritz and Tabora⁹ with some minor modifications. The method is simple enough to be used in the office or in the sick room in the home. The patient should be in the supine position with the arm in about 45 degrees of abduction. It is important that the arm be completely relaxed and that no clothing be permitted to impair venous return from the extremity. The arm should be so placed in the horizontal plane that the anti-cubital vein is 5 cm. posterior to the junction of the fourth rib with the sternum. The equipment needed includes a glass L tube of 2 to 4 mm. bore with an adapter to fit an 18 gauge intravenous needle. The tube should be filled with normal saline or sodium citrate solution. The needle is inserted into the vein, the tourniquet is removed and the level to which the column of fluid falls is observed. The distance from the top of the col-

umn of fluid to the zero point is the venous pressure. The range in normal individuals was found by Moritz and Tabora to be from 1 to 9 cm. of water.

The location of the zero point has been the subject of some discussion. Burwell⁸ et al. found that the above described zero point resulted in falsely low values in deep chested individuals. They suggested measuring 10 cm. anteriorly to the surface of the back with the patient in the supine position. The difficulty in locating precisely the surface of the back when the patient is lying on an ordinary bed makes this method somewhat impractical in the ordinary conditions of medical practice.

Richards¹³ et al. inserted a catheter into the right auricle via the anti-cubital vein and checked the position by means of x-ray. They found that measuring 7 cm. posteriorly from the junction of the manubrium and the sternum (angle of Louis) gave the closest agreement to the anatomical location of the right auricle. Using this method of locating the zero point we have found at the University of Minnesota hospitals that the range of venous pressure normally is from 1 to 10 cm. of water.

FACTORS GOVERNING VENOUS PRESSURE

The amount of blood in the systemic veins and the pressure which it is under will depend upon a number of factors. (1) The rate at which blood is flowing from the capillaries to the venules obviously will be important. (2) Since the veins possess a muscular wall, variations in muscular tone will influence venous pressure. (3) The amount of blood within the venous system will influence venous pressure. It must be remembered that relaxation of the venous tone may increase the venous capacity and accommodate an increased blood volume without an increase in pressure. (4) Extravascular aids to venous return include respiratory movements and intramuscular pressure. For an excellent review of the effect of respiration the reader is referred to Fishberg's³ discussion. Gunther⁴ has shown that a close relationship exists between intramuscular pressure and venous pressure. He demonstrated that in shocklike states the fall in intramuscular pressure precedes the fall in venous pressure, and that during recovery from shock the rise in intramuscular pressure precedes the rise in venous pressure. (5) Cardiac function will greatly influence venous pressure and will in turn be influenced by venous flow into the right side of the heart. The cardiac output per beat (stroke volume) will be increased by an increase of venous flow and the resultant increase in diastolic filling. In addition the increased pressure within the great veins will cause, by means of the Bainbridge reflex, an increase in the heart rate, thus further increasing the cardiac output per minute.

VENOUS PRESSURE IN HEART FAILURE

Failure of the right side of the heart is the most common cause of elevated venous pressure. In the early stages of right-sided decompensation the venous pressure

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may be normal until the veins have become completely filled. With severe right heart failure venous pressure values between 30 and 40 cm. are not uncommon. As the patient improves these values gradually fall, giving the physician a tool in following the progress of cardiac patients.

THE APPLICATION OF VENOUS PRESSURE IN DIAGNOSIS

The venous pressure measurement is probably most useful in determining whether peripheral edema is due to right heart failure or to some other cause. The patient with hypertension and nephritis may have edema due either to heart failure or to renal disease or both. If the venous pressure is elevated, heart failure must be at least a contributing factor in the edema. The pregnant cardiac patient may develop edema of the legs during the third trimester of pregnancy. If the venous pressure is normal in the arms one may feel confident that heart failure is not present and that the edema is probably due to obstruction of the venous return from the lower extremities by the enlarged uterus.

The patient with cirrhosis of the liver presenting the signs of edema, an enlarged liver, and ascites may be suspected of having right heart failure. This may quickly be ruled out by the finding of a normal venous pressure.

Obstruction of the superior vena cava may be suggested by the finding of an increased pressure in the anti-cubital veins and a normal pressure in the femoral veins. The reverse would be true if the obstruction were limited to the inferior vena cava.

THE CIRCULATION TIME

The velocity of the blood varies in the different parts of the circulatory system. As the circulatory bed widens out in the capillaries, the speed of flow is greatly reduced. As the cross-sectional area decreases as the blood nears the heart the velocity increases. The circulation time may be defined as the time required for the blood to travel over a given portion of the circulation. In this discussion the measurement of two different circulation times will be described.

The arm-to-tongue circulation time (A-TT) is the time required for a particle of blood to go from the anti-cubital vein to the tongue. The arm to lung circulation time (A-LT) is the time required for a particle of blood to travel from the anti-cubital vein to the pulmonary capillaries. The lung to tongue time (L-TT) or pulmonary circulation time may be obtained by subtracting A-LT from A-TT.

Many methods have been suggested for the A-TT determination. All of them have one or more disadvantages and a detailed discussion will not be entered into here. At the University hospitals we have found Decholin (sodium dehydrocholate) to be satisfactory in most circumstances. It was first used in determining velocity of blood flow by Winternitz.¹⁴

The patient should be relaxed in the supine position with the arm at the level of the right auricle. The patient should be asked to signal the instant a bitter taste appears on the tongue. Five cubic centimeters of 20 per cent Decholin is then rapidly injected into the anti-cubital

vein and the time is measured with a stop watch from the start of the injection until the patient gives the signal. In the normal individual the A-TT with Decholin ranges from 10 to 16 seconds.

The A-LT⁵ is performed similarly, using 5 minims of ether mixed with 3 minims of normal saline solution. This mixture is injected rapidly and the time measured from instant of injection to the instant when the patient first smells the ether or the observer detects the odor of ether on the patient's breath. The normal range for the A-LT (ether time) is 4 to 8 seconds.

The use of Decholin is not advisable in the presence of significant liver disease. We have never observed any damage from Decholin to the passively congested liver in heart failure. Toxic reactions to Decholin have been noted by Leys⁷ but these are not common and have not been experienced thus far at the University hospitals. The injection of the ether mixture not uncommonly causes some transitory discomfort along the course of the veins and occasionally may cause venous thrombosis.

Many factors other than heart failure influence the circulation time. Some of these are exercise, excitement, fever, digestion, anemia and hyperthyroidism, all of which increase the velocity of blood flow and reduce the circulation time. For this reason values obtained on repeated determinations may vary rather widely and it has been suggested² that an attempt be made to have the patient under basal conditions if one intends to draw any conclusions from serial determinations.

CIRCULATION TIME IN HEART FAILURE

As decomposition occurs the velocity of blood flow is reduced. This is due in part to an increased cross-sectional area of the circulatory bed as occurs in the pulmonary circulation in left heart failure. In addition, Nylin^{10,11} has emphasized the fact that the greatly enlarged heart only partially empties itself with each contraction and this residual blood results in a delay in the distribution of the injected substance from the heart to the lungs and/or the tongue.

THE CIRCULATION TIME IN DIAGNOSIS

The most important application of the circulation time is in the diagnosis of the causes of dyspnea. Bronchial asthma has been shown^{1,12} to have a normal A-TT while in cardiac asthma the A-TT will be prolonged.

Patients with chronic pulmonary disease and a reduced vital capacity may have also coincident heart disease which could give them left heart failure and contribute to their dyspnea. Heart failure can be ruled out in such cases by the finding of a normal circulation time. Dyspnea due to obstruction of the respiratory tract can also be distinguished from cardiac dyspnea by the normal circulation time.

The presence of a congenital cardiac lesion with a right-to-left shunt is suggested by the finding of A-LT and A-TT that are equal.

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Rupture of Heart: Review and Case Report*

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AS a cause of immediate death, rupture of the heart has been recognized for many generations. Comitant with our newer concepts and knowledge of coronary artery disease and myocardial infarction, its clinical significance is being more adequately interpreted. The incidence of cardiac ruptures in acute myocardial infarctions among psychotic, and hence uncooperative patients^{1,8,9} leads one to review the subject that a better understanding of the problem be ascertained. Most physicians are cognizant of the fact that in the presence of an acute coronary thrombosis, bed rest, adequate sedation and an intelligent cooperation must be obtained immediately and carried out judiciously. This paper reviews the incidence and genesis of cardiac rupture as a complication of acute myocardial infarction, with a view toward its prevention.

Survey of the literature would indicate that cardiac ruptures occur with greater frequency than ordinarily expected.^{1,9} Antemortem diagnosis can be more readily established if the sequence of coronary artery disease is borne in mind. Occasionally heart ruptures are end results in subacute bacterial endocarditis.^{2,3} Brown and Evans⁵ point out that sometimes cardiac rupture results from a calcified myocardial infarct, in which coronary sclerosis is the common cause of primary massive myocardial calcification, as evidenced in ten out of fourteen cases reported. Much less frequently, rupture of the heart may be due to non-penetrating forms of trauma to the chest.⁷

The most common cause for cardiac rupture is that of coronary artery disease in which thrombosis and infarction play the important role. In reviewing autopsy reports¹ of cardiac ruptures, 37,000 necropsies in three large general hospitals showed an incidence of .06 per cent ruptures, while two more recent surveys in private and general hospitals, which included 29,657 autopsies, gave a figure of .29 per cent. Ruptures occurred more frequently in 2,112 coroner's autopsies, 1.2 per cent, and even higher in institutions for elderly patients with mental disturbances (2,374 autopsies with 1.3 per cent). The incidence of cardiac ruptures in acute myocardial infarctions varied from 8 per cent at the Los Angeles County hospital,¹ to 9.5 per cent at the Massachusetts General hospital,⁸ and up to 73 per cent in Massachusetts mental institutions.⁹ The age incidence of cardiac ruptures parallels the frequency of myocardial infarction. There is a high incidence of rupture between the ages of 50 and 79. The average age of ventricular ruptures appears to be about 66.^{1,8,9}

Weber's survey⁴ showed an average age of 59 in a total of 34 reported cases of interventricular septum ruptures. Other figures indicate that males are affected

slightly more frequently. Obesity has not been found to be an important factor although it is theorized that increased fatty infiltration into the myocardium lessens collateral circulation, and thereby increases likelihood of necrosis. The sites of rupture show predominance of ruptures in the left ventricle, particularly the anterior portion. The least frequent area involved is the right ventricle. Most authors^{1,4} agree that perforation of an infarcted interventricular septum is less likely than ventricular ruptures. The anterior descending branch of the left coronary artery is the one most frequently involved in thromboses that preceded ruptures.^{1,6,9} Willius⁶ describes this artery as supplying the anterior portion of the left ventricle and contributing to the blood supply of the apex. This vessel is involved in ruptures of all portions of the ventricles and septum except the posterior part of the right ventricle.¹ The circumflex ramus of the left coronary artery is next most frequently involved since it supplies the anterior surface as well as the apex of the left ventricle. The right coronary artery may be incriminated since it too may supply the entire posterior surface of the left ventricle. Reviewing the frequency of coronary thromboses one concludes that the right coronary artery appears to be superficial and relatively small with gradual ramifications. On the other hand, the left coronary vessel is larger, has deeper penetrating branches and because it nourishes a greater muscle mass, it is prone to be more serious if thrombosis occurs here.

The size of the infarcts, the presence of scarring in areas of infarction and the relationship of hypertension in a series of 72 cases of rupture of the heart were studied.¹ In ruptured hearts where the infarct was 5 cm. or smaller, it was noted that the tension was greater or the necrosis more extensive. Similarly it was found that few hearts with large infarcts could support elevated blood pressure. In the 16 cases of rupture of the heart reported by Jetter and White,⁹ the infarcts were characteristically large and averaged 4 to 5 centimeters in diameter. In reviewing cases of ruptured hearts, it was found that the height of the intraventricular pressure varied inversely as the size of the infarct. In all cases of myocardial infarction, the hearts which ruptured were generally those in which the blood pressure persisted at 140/90 or above after infarction. Where the blood pressure was not elevated, the number of ruptured hearts was extremely low. The same studies indicated that if scarring is present in the infarcted myocardium, the likelihood of rupture is one-fourth as great as in the unscarred hearts. The scarring appears to increase collateral circulation at the site of infarction so that subsequent areas of infarction are less likely to be soft and friable. Another thought advanced is that an area of infarction containing fibrous tissue is more impervious to ischemia. The conclusions derived from these observations are substantiated by noting that ventricular ruptures occur only

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with acute myocardial infarctions, before organization and cicatrization take place.

The study¹ revealed that the proportion of ruptures is highest in the group with small or normal (400 grams or less) hearts associated with hypertension, and lowest in the group with large hearts and low blood pressures in a ratio of 6:1. The incidence of rupture in areas of recent infarction is in direct proportion to the amount of myocardium involved, the extent of necrosis, polymorphonuclear leukocytic infiltration and lack of scarring. The chief factors in determining ruptures are the degree of softening of the infarcted areas and the height of the intraventricular pressure.

The time of rupture has been found to be relatively consistent by most authors. Levine³ states rupture is unlikely before the fourth to seventh day while Edmondson and Hoxie¹ showed an average calculated time from infarction to rupture in their 72 cases as 7.4 days. They mention six instances of rupture believed to have occurred one day after infarction. Death occurred immediately after the rupture in nearly all the cases. Other authors^{8,9} indicate that in their series of cardiac ruptures following acute myocardial infarction, most deaths occurred within a period of two to ten days. Ventricular ruptures are rare two weeks after coronary insult. In considering interventricular septal ruptures,⁴ antemortem diagnoses were more readily established here than in ventricular ruptures. This is explained by the relative ease in recognition of the rupture by (a) history (b) E.C.G. changes showing infarction, (c) sudden appearance of a loud systolic murmur and thrills to the left of the sternum and (d) by the relatively longer life span after rupture ensues. Duration of life after murmur had appeared (which indicated time of rupture of the septum) varied from a few days to several months in these cases.

The diagnosis is suggested by history of previous coronary insufficiency or recent acute thrombosis, presence of a small or normal size heart, persistency of, or return to elevated blood pressure, symptoms and findings of infarction, and acute, sudden collapse which immediately precedes death. In cases of interventricular septal rupture, a systolic murmur intervenes after perforation. If sufficient time elapses after the coronary insult, electrocardiographic changes will show evidence of myocardial infarction. All too frequently, the time interval between suggestive symptoms and the consummation in case of rupture is too brief to obtain a confirmatory tracing.

CASE PRESENTATION

M. L. W., a white male of 48 who was a farmer by occupation stated that because of extensive abdominal surgery following a gunshot wound many years ago, he was unable to perform heavy manual labor except for intermittent short periods. He had had no medical care for any cardiac ailment. Previous hospitalization included operations for gunshot wounds of the abdomen, intestinal adhesions and fecal fistula. On admission he stated that he had had a severe precordial pain which radiated down his left arm about 10:00 P.M. on August 3, 1944. He had been doing considerable physical labor that afternoon. The acute precordial distress persisted for several

hours but no physician was called. The following morning the pain returned and he entered the hospital at 1:00 P.M. complaining of dull pain under the sternum.

Examination on admission showed a fairly comfortable patient of slight build who was mildly dyspneic and apprehensive. His temperature was normal, pulse 76, respiration 16. The heart sounds were distant but of fair quality. No murmurs, cyanosis, edema or ascites were present. The second aortic sound was accentuated. The blood pressure was 176/106. He had two postoperative and gunshot wound scars of the abdomen; a ventral hernia and a right inguinal hernia. An E.C.G. was taken two hours after admission and revealed only myocardial damage. Other laboratory reports were negative.

Patient was fairly comfortable that evening and night. At 4:50 A.M. he complained of a severe pain in the left side of his chest which morphine and atropine relieved. Several hours later the blood pressure was 140/100, pulse 70. At 5:15 P.M. he evinced severe cardiac pain and had marked diaphoresis. His pulse was 80. Morphine and atropine as well as oxygen were administered at intervals throughout the night. He became more apprehensive as the pain became more severe. Precordial pain persisted despite opiates. His pulse became more rapid. He had five emeses after 7:30 P.M. but was able to rest intermittently until 5:30 A.M. when he cried out because of the acute, severe, cutting pains in his chest. He was pronounced dead ten minutes later, forty-one hours after admission.

Autopsy was performed three hours after death. The essential pathology was found in the heart. The pericardial cavity contained about 150 cc. of blood. The heart weighed 410 grams. A ragged tear 6 cm. in length was present on the anterior surface of the lower third of the left ventricle near the ventricular septum. The rupture had occurred through an infarct, 5 x 3 cm. involving the middle and lower thirds of the myocardium. The infarcted area was greyish, punctuated by recent hemorrhages, soft and thinned out. The myocardium of the right ventricle and the remainder of the left ventricle appeared normal. There was considerable coronary sclerosis throughout. A recent occluding thrombus of the anterior descending branch of the left coronary, midway down the left ventricle, and a partial occluding, less recent thrombus in the left circumflex branch on the lateral aspect of the left ventricle were found. Microscopically at the site of rupture there was recent extensive necrosis. There was an infiltration of red blood cells and young fibroblasts.

SUMMARY AND CONCLUSIONS

1. Cardiac rupture with acute myocardial infarction is more readily recognized with the advent of newer concepts and knowledge of coronary artery disease.

2. The incidence of cardiac rupture in acute myocardial infarction varies from less than 10 per cent in general hospitals to 73 per cent among those in mental institutions; age incidence is 50 to 79, slightly higher in males than females; increases with persistency of or return to elevated blood pressure, and with lack of adequate rest and sedation; greater frequency in small hearts with hypertension; greater frequency with large areas of

necrosis, but less frequent where scarring occurs; most frequently within ten days after infarction; most frequently involving left coronary artery and its rami; affects the left ventricle more than any other site.

3. Prophylaxis is cooperative, intelligent understanding of the problem, familiarity with condition, adequate bed rest and sedation after coronary insult.

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Digitalis: Its Legitimate Field of Usefulness*

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DIITALIS stands as one of the great achievements of medical treatment. It is the oldest and most useful agent for the treatment of heart disease. Unlike other specific drugs, its action is not on an organism or a toxin but on a mechanism. It supports a failing heart—not any diseased or abnormal heart—but a failing heart. A failure to understand this has led to much indiscriminate and even harmful use of digitalis.

William Withering, an English physician, first reported the employment of digitalis in the treatment of cardiac dropsy in 1785. He set forth clear rules for its use, which, however, were given little attention for more than a century. By Osler's time, doctors were again beginning to use it with some degree of efficiency. But it remained for Dr. Cary Eggleston of New York to place its use on a scientific basis only twenty-five years ago. He taught us how to use digitalis with almost mathematical precision. Following his work and as a result of it, there has been developed a clear delineation of its field of usefulness.

I shall present this subject by briefly discussing first: indications for the use of digitalis; second: conditions in which its usefulness is doubtful; third: conditions in which it is not indicated; and lastly: conditions in which its use may be harmful.

The indications for the use of digitalis can be deduced from an understanding of its action. Digitalis acts upon the heart in three rather definite ways: (1) It depresses the pace-making function of the sino-auricular node, and thus slows the heart rate. (2) It reduces the conductivity of the Node of Tawara and the Bundle of His, which are the paths over which the impulses for muscular contraction of the heart pass. (3) It acts directly on the heart muscle, causing more complete contraction.

There are four indications for the use of digitalis: (1) Congestive heart failure. (2) Cardiac asthma. (3) Auricular fibrillation or auricular flutter. (4) Digitalis may be wisely used as a therapeutic test when it is uncertain whether a slight degree of congestive failure is present, as in the case of very old people with dyspnea of exertion.

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tion. These four indications for the administration of digitalis are clear. There are no others upon which there is general agreement, except one doubtful indication which will be mentioned later.

The signs of congestive heart failure—dyspnea, cough, enlarged liver, edema—are easily recognized (and by dyspnea, I do not mean sighing respiration). In an article published in 1940, Levine maintains: "It must be borne in mind that digitalis is indicated in congestive heart failure whether the blood pressure is high or low, whether the rhythm is regular or grossly irregular and whether the rate is rapid or slow. It is to be used in myocardial or in valvular disease, whether fever is or is not present and whether the basal metabolism is normal or elevated. The results to be expected may differ under varying circumstances but the indications for its use remain the same."

The average doctor can easily make the diagnosis of congestive failure. There can be no doubt, except in an occasional patient who has dyspnea as the sole symptom. With such a patient, if the history, the age of the patient, etc., definitely suggest congestive failure, we have opportunity for the use of the therapeutic test. If the patient knows he is receiving digitalis, and does not experience relief, following full dosage, he may be told that he does not have heart failure.

In cardiac asthma (paroxysmal dyspnea), of course, digitalis is useful not during the attack, but in intervals between attacks, as a preventive. The patient here is generally an elderly person, who often responds very kindly to slow digitalization followed by maintenance doses.

Auricular fibrillation, likewise, can in most cases, be diagnosed readily by the average doctor. Most patients with a tumultuous irregularity of rhythm, with tachycardia and pulse deficit, have auricular fibrillation, particularly if the condition has started abruptly with palpitation. Most patients with acute auricular fibrillation receive dramatic relief from digitalis when properly managed—particularly if sedation also is employed with discretion.

Auricular flutter cannot be diagnosed clinically by the general practitioner and probably not by the cardiologist.

This condition is revealed only by the electrocardiograph. However, the average doctor need give auricular flutter little thought as it is a rather rare condition.

Indication for the use of digitalis in paroxysmal auricular tachycardia is open to question. No one has ever reported successful treatment of the attack by digitalis. However, there have been some reports of digitalis having been used successfully as a preventive in patients who have frequent attacks. Some years ago Levine and Blotner presented four cases in which they found that keeping the patient digitalized had proved effective in preventing recurrence. This is a small number of cases, but Levine reaffirms this position in his recent textbook on heart disease (1941).

I shall now mention several conditions in which there is no indication for digitalis. There is no indication for digitalis in patients who have effort syndrome, palpitation or precordial pain but who do not have heart disease. These patients are the victims of anxiety, nervous exhaustion or both. Many patients and a few doctors believe that digitalis has been of benefit in these conditions. However the benefit is to the mind and not to the heart. This last point is often proved by the small or infrequent doses which these patients tell us give them relief. Digitalis does not exhibit its action except when given in full doses to digitalization and then continued in properly planned maintenance doses.

Digitalis is not indicated in congenital heart disease (*per se*). These patients generally suffer from anoxemia rather than from congestion. In recent years, I have tried digitalis on two patients who probably have had congenital heart disease. It did not benefit either patient. One of these young patients died about three years ago, but without congestive failure. The other patient, now aged twenty, is in fair health.

During the last ten years, cardiologists have come to the conclusion that there are about three fairly clear contraindications for digitalis, to-wit: acute infectious fevers, acute coronary infarct and circulatory collapse—commonly called shock.

There is, at times, a definite acute infection of the myocardium in pneumonia, scarlet fever, subacute bacterial endocarditis or in rheumatic fever. But congestive failure does not usually occur. Even if it does, digitalis, which is itself a mild protoplasmic poison, should be used with great caution.

For years, many good doctors believed that when a diagnosis of pneumonia was made, digitalis should be

started. But this position is no longer tenable, because of the work of Wyckoff and his associates in 1930. From Bellevue Hospital, at this time, he reported a large series of patients with pneumonia who had received digitalis routinely. There were controls in equal number. The death rate among the controls was about 7 per cent lower than in the patients who had received digitalis. Cohn and Lewis confirmed Wyckoff's position by their work in 1935. The conclusions of these men are now generally accepted. Furthermore, recent work is demonstrating that patients with acute infectious disease, die probably not of heart failure but from toxemia and peripheral circulatory failure.

Digitalis is not indicated in conditions of shock or collapse, for obvious reasons. There is no failure of the heart and there is no primary arrhythmia. It is even contraindicated because of the depressant action of the drug upon the pacemaker. By its vagal action on an unfailing heart, it may actually decrease the output. Shock is not well understood. However, we feel fairly sure the circulatory failure is not central but peripheral.

In acute coronary infarct, digitalis is now considered contraindicated because of its probable constrictive action on the coronary arteries. This contention rests largely on theoretical grounds, but cardiologists seem fairly agreed as to its tenability. If congestive failure supervenes some weeks or months after infarction, digitalis is, of course, indicated. However, in this situation, the wise doctor will be cautious in prescribing digitalis.

In conclusion, may I suggest that, during the last twenty-five years and particularly during the last ten years, modern research has so carefully delineated the proper therapeutic field for digitalis that we can now consider this drug nearly as truly a specific as sulfathiazole or diphtheria antitoxin. This has been one of the great medical accomplishments of the last generation.

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FELLOWSHIPS OFFERED IN NEUROPSYCHIATRY

For the benefit of those interested in neuropsychiatry, the Austin Riggs Foundation of Stockbridge, Massachusetts, has announced that fellowships for three years' training in this specialty are now open. Army personnel who wish to go into this field may apply to Dr. Charles H. Kimberley, Medical Director, Austin Riggs Foundation, Stockbridge, Massachusetts.

The Treatment of Rheumatic Fever

M. J. Shapiro*

Minneapolis, Minnesota

AS invariably happens when people are kept in close contact for any period of time, infectious diseases become widespread. The crowding of troops in army camps during the recent war resulted in marked increase in various diseases of infectious nature. Fortunately, most of these epidemics were kept under control by the use of the newer chemotherapeutic agents, the sulfonamides and penicillin. Unfortunately, the chemotherapeutic agents which were so successful in various other diseases had no effect on rheumatic fever. In fact, it has been shown definitely that both the sulfonamides and penicillin are actually harmful when given during the acute phase of rheumatic fever. A very serious spread of rheumatic fever occurred in a number of army and navy camps. Thousands of young men and women developed rheumatic fever and many of them were left with more or less permanent cardiac damage. While no new specific cure has come out of the war experience, the knowledge gained from contact with thousands of cases eventually will lead to real progress.

Drug Treatment. During the past few years, enthusiastic claims have been made concerning the treatment with large doses of salicylates. One report concluded that when such large doses were given, especially intravenously, cardiac damage could be prevented. Stress was laid on the necessity for serum-level controls. This work has not been corroborated—in fact, several recent studies have shown that the salicylates have no effect on the progress of the development of rheumatic lesions. Patients who were receiving adequate salicylate treatment, proved by blood study controls, developed new nodules, increasing cardiac damage, and even died. Further studies revealed what had been known for years, that salicylates are readily absorbed from the stomach and that it is not necessary to give intravenous treatment. Furthermore, parenteral introduction of salicylates is dangerous, produces frequent severe reactions, and in a few instances even death has occurred during such treatment. As a result of all these studies, it is reasonable to conclude salicylates to be the most effective drug available in the treatment of rheumatic fever; but this should not raise false hopes that such treatment has any effect in controlling the infection or prevention of cardiac damage. Salicylates make the patient much more comfortable, but there is no evidence that they shorten the disease. The salicylates, usually in the form of sodium salicylate, should be given in as large doses as the patient can tolerate without developing toxic manifestations. Intravenous treatment is contraindicated and blood study controls are not necessary for practical purposes. No other drug is at present available which is preferable to the salicylates.

Serum, Vaccine, and Transfusions. Many vaccines and serums have been proposed for the treatment of rheu-

matic fever. There is no conclusive evidence that any of these are effective. Occasionally, small transfusions of whole blood seem to have a favorable effect. During the acute phase of the disease, anemia is frequently present. This should be treated by large doses of iron by mouth. An adequate high-caloric, well balanced diet is necessary. Additional vitamins seem advisable.

Convalescent Treatment. Long continued bed-rest in an optimum environment is the most important single factor in the treatment of rheumatic fever. It is rare to find patients with the fulminating type of disease with severe toxemia and red, swollen, extremely painful joints. Surely the majority of patients in this part of the country have relatively mild symptoms. In spite of this, the disease smoulders for many weeks and months. It is essential that such patients be kept at strict bed-rest until all evidence of rheumatic activity has ceased. It is difficult to keep children in bed for months, especially when this is attempted in the home. The convalescent hospital is ideal for the treatment of such patients. They are much happier and more content to remain in bed when in a ward with other children receiving similar treatment. There is a real need for the development of such hospitals throughout the country. In such an institution, patients not only receive adequate bed-rest, but they are under constant professional supervision. They keep up with their school studies by bed-side teaching and, in the case of older children, receive vocational guidance. Furthermore they are permitted out of bed gradually, during which time various studies are made to determine whether or not the infection has become inactive.

One of the most difficult problems in the treatment of rheumatic children is to determine when it is safe to permit the child out of bed. It is well known that fever and leukocyte counts are not good criteria. Patients with active rheumatic infection may have normal temperature and normal white blood counts. Since the introduction of the blood sedimentation rate, this simple test has been used as a practical method of determining the stage of rheumatic activity. Unfortunately, enough is not known about this test. For instance, we do not know as yet what actually causes an increased sedimentation rate. All texts on rheumatic fever stress the importance of keeping patients in bed until the sedimentation rate is normal. This is a good policy in the great majority of cases. Not infrequently, however, patients are observed continuing to show an increased sedimentation rate when all other evidence of activity has disappeared. Such patients have been kept in bed for months merely on the basis of a moderately increased sedimentation rate. It seems reasonable in these cases to permit such patients out of bed gradually during which time they are observed carefully. If no evidence of reactivation occurs and if the sedimentation rate does not increase, the patient may become normally active. In several such cases under our observation, the sedimentation rate has returned to normal after the

*Minneapolis Children's Heart Clinic and Hospital.

patient was activated, with no apparent ill effect.

This problem is still unsettled. The clinician will necessarily have to use his best judgment in determining when such patients can become active. It is quite apparent that too much value has been placed on the sedimentation rate. This will be changed after a re-evaluation of the whole problem of the sedimentation rate has been made. Such studies are imperative at this time.

The Electrocardiogram is another means of value in determining rheumatic activity. Frequent electrocardiographic tracings are necessary and this procedure is practical only in a convalescent hospital. When the electrocardiogram becomes fixed and no further changes are noted, it may be concluded that active myocardial disease has ceased.

Tonsillectomy. Tonsils and other foci of infection should not be treated during the acute phase of the disease. It is not necessary to remove the tonsils in every case of rheumatic fever. If there is conclusive evidence that the tonsils are a source of infection, they should certainly be removed. There is no evidence that the removal of the tonsils affects the onset or recurrence of rheumatic infection. The removal of teeth and the draining of sinuses should not be done merely on the basis of a history of rheumatic fever.

On Prevention of Recurrences. A number of studies have appeared in recent literature which indicate that the giving of small doses of the sulfonamides has a favorable effect in prevention of recurrences of rheumatic infection. When children are receiving such preventive treatment, they should be kept under constant supervision as a few deaths have occurred as a result of such procedure. With the introduction of penicillin by mouth, it seems quite probable that penicillin will take the place of the sulfonamides for the preventive treatment of rheumatic fever. Certainly children will be considerably safer receiving penicillin than they were while receiving the sulfonamides. There is no evidence that the salicylates have any effect in preventing recurrences.

Conclusions: (1) No new startling method of treatment for rheumatic fever has been devised. (2) The salicylates still constitute the best drug in the treatment of the acute phase. (3) The most important single factor is convalescent care. (4) Tonsillectomy should be done only where definitely indicated. (5) It is important that the problem of the sedimentation rate in rheumatic fever be restudied. (6) The sulfonamides are probably effective in preventing recurrences but it is hoped that penicillin will soon replace the sulfonamides for this purpose.

Abstracts of Articles on Heart Disease

The *Journal of Venereal Disease Information*, published by the Federal Security Agency United States Public Health Service, in its September issue refers to two articles from the *American Heart Journal* of St. Louis. The first of these papers is entitled *Heart Disease in the South: a statistical study of 1,045 cardiac deaths*. Contributor—Alice Baker Holoubek; date of publication, February 1945. The reference is as follows:

"The purpose of the study reported in this paper was to determine the etiology of cardiac deaths in the South.

Autopsy records of the Charity Hospital of Louisiana during the period 1935 to 1940 were reviewed, and all deaths due primarily to heart disease were studied and classified etiologically. Since the survey was confined to charity cases, the study covers patients of the lower economic groups only.

Of the 1,045 deaths recorded, 665 (63.6 per cent) were those of Negroes, and 380 (36.4 per cent) white people. Syphilitic cardiovascular disease accounted for 190 (18.2 per cent) of the 1,045 deaths. Of these, 163 were among Negroes and 27 among whites, the ratio being roughly 6 : 1. There were four times as many deaths due to syphilitic heart disease among males as among females, considering both races.

Charts are given showing total incidence of syphilitic heart disease by race and age, and the incidence of that condition in different geographical areas of the United States as shown in fifteen studies by various authors is tabulated."

The second reference is to *The Incidence of Heart Disease in Puerto Rico: a statistical analysis of 1,081 cases*: written by Ramon M. Suarez. Date of publication, March 1945. The reference is as follows:

"The author reports the results of a study of 1,081 cases of heart disease found among Puerto Ricans of all economic and social strata but predominantly among those of the upper intellectual and economic levels. Ninety per cent of these were white and 10 per cent Negro; 67 per cent were male and 33 per cent female.

Findings are compared with those of studies by other authors on heart diseases in Puerto Rico, as well as in Argentina, Mexico, the New England States, and in the states of New York, Virginia, and Louisiana.

In the present study, the incidence of cardio-aortic syphilis among Puerto Ricans was found to be 6.1 per cent, a lower rate than that given by certain other authors, whose studies were, however, confined to low social and economic groups.

A bibliography of 19 references is given."

ON THE FOUNDING OF A VARIETY CLUB HEART HOSPITAL AT THE UNIVERSITY OF MINNESOTA*

Cecil J. Watson, M.D., Minneapolis, Minnesota†

So far as I am aware it is a unique occasion in this country on which a group of public spirited citizens meet to consider the founding of a heart hospital. I count it a privilege to be here this evening, and to have an opportunity to tell you something about the general problem of heart disease, particularly as it relates to the life of the average citizen. It is quite true that diseases of the heart and arteries now stand well in the forefront of the causes of death, easily ahead of the infectious diseases and of cancer and comprising from thirty-five to forty per cent of all deaths. Apart from congenital varieties, there are three principal groups of heart diseases: 1) rheumatic, 2) syphilitic and 3) high blood pressure and arteriosclerosis. Of these three, syphilitic heart disease is the only one which may be prevented. The recent acquisitions in the fight against infectious disease, i. e., the sulfa drugs and penicillin, are helpless against the effects of rheumatic fever. It is true that the continuous administration of sulfonamides to patients who have had attacks of rheumatic fever, does tend to prevent recurrence, but this method has disadvantages and dangers. The cause of rheumatic fever is but poorly understood, that of high blood pressure and arteriosclerosis or hardening of the arteries even less so. The latter conditions are those most often associated with the sudden deaths in relatively young men with which we are all too familiar; men in their forties and fifties who are just at the prime of life and making their finest contributions, both to their family and to society. It is essential that something be done soon about this problem. To a nation whose intellect and resources have fashioned the atomic bomb and introduced the age of atomic energy, it should not be too difficult to encompass this problem of sudden death in men of their prime.

Rheumatic heart disease may kill at any age, either in childhood, early adult life or later. It usually does not cause sudden death, but rather a variable period of heart failure characterized by growing discomfort due to shortness of breath and so-called dropsy, swelling of the extremities and abdomen. Quite commonly there is a long period of normal health between the initial attack or attacks of rheumatic fever in childhood and the ultimate heart failure causing death. In many instances the initial attack is so mild that it passes unrecognized. The individual may have had nothing more than repeated sore throats or tonsillitis and perhaps a few pains thought at the time to be "growing" pains. During the past eight years I have had the privilege, and, at the same time the sadness of caring for an unusually intelligent and charming woman, a wife and mother who died at forty-six of rheumatic heart disease. This woman was unaware of any previous attack of rheumatic fever, knowing of nothing more than tonsillitis and growing pains in childhood, yet the heart valves were scarred by rheumatic disease.

*Address delivered at the Variety Club Heart Hospital Founder's Dinner, Minneapolis, September 13, 1945.

†Department of Medicine, University of Minnesota.

It may well be that this long latent period, or the lack of initial symptoms, and hence of any spectacular relationship, is the reason why rheumatic fever and rheumatic heart disease are relatively forgotten in the allotment of funds for research. Last year the March of Dimes alone contributed sixteen and a half million dollars to research on infantile paralysis; while it is very doubtful that a tenth of this amount was provided for rheumatic fever research, yet rheumatic fever is very much more than ten times as important a disease as infantile paralysis, regardless of whether one looks at the matter from the standpoint of crippling or death. Someone has recently gathered statistics to show that for every death due to infantile paralysis, more than five hundred dollars was spent on research, while the corresponding amount for rheumatic fever was but sixteen cents. While no one would decry an all-out attack on polio, it is obviously a twisted and mistaken economy which is characterized by such an enormous imbalance as this. We must admit to a sentimentalism which at times beclouds our sense of perspective.

In our support of medical research, we should give priority to the diseases which are the principal killers, not those which are relatively unimportant. It seems to me that the best possible beginning in this direction is the establishment of a heart hospital such as that envisioned by the Variety Club. In addition to the affording of up-to-date medical care such a hospital will provide clinical material which is essential to medical research. I might emphasize at this point that the "guinea pig" concept is quite unfortunate and ought to be supplanted in lay minds generally, by the realization that the thorough study and care devoted to patients in first-class research hospitals is generally much to their benefit. The more one finds out about a patient, the more often can something real be effected. In other words, medical research and medical care, rather than conflicting with one another, actually go hand in hand, if properly conducted.

The possession of a hospital alone is, of course, not enough for a concerted attack on the problems of heart disease. Investigators and funds for equipment and technical assistance are also essential, but the hospital and its clinical material will attract both men and money. Foundations are much more willing to make grants in aid of research when adequate facilities can be listed as already available. The facilities should include the possibility of continuous association of the research in one way or another with other scientists, such as pathologists, physiologists, chemists and physicists. An association of this type is very difficult to achieve except on the campus of a great university.

Let me say finally that this heart hospital, which the Variety Club has so generously offered to sponsor, will not only make its contribution to the care and study of patients with heart disease, but it will set a shining example to the rest of the country and will thus reflect credit on the Twin Cities and the Northwest.

... MEET OUR CONTRIBUTORS ...

Dr. S. Marx White, Minneapolis, one of the deans of the profession hereabouts, has held presidencies without precedent in state and national medical bodies, lectureships and professorial responsibilities at the state university, the chairmanship of community enterprises and many other honors that an appreciative public accords to capacity and a willingness to give service. His bestowals on this journal, of a literary character and in counsel, have been generous and incalculably valuable. Northwestern university claims him as a graduate.

Dr. Reinhold O. Goehl, clinician of Grand Forks, North Dakota, graduated from the University of Minnesota in 1930 with a cum laude M.B. to amplify his B.A., B.S. and M.D. Following his graduation he took additional work at the University of Indiana and at Minnesota, became a fellow of the American College of Physicians and attained to the Board of Internal Medicine and Cardiovascular Disease. During his fifteen years of practice in Grand Forks he has made an occasional appearance in these columns.

Dr. Arlie R. Barnes, Rochester, Minnesota, having graduated from University of Indiana School of Medicine in 1919, has specialized in internal medicine in which subject he is a professor at the University of Minnesota medical school and to which he devotes himself at Mayo clinic.

Dr. Harold W. Gregg, Butte, Montana, graduating from the University of Colorado Medical School in 1920, engaged in postgraduate work there, at the University of Minnesota and at New York Post Graduate Medical School. This internist has been president of his district medical society, Silver Bow county, and state organization, was formerly a fellow of the American Society of Clinical Pathologists, is now a fellow of the American College of Physicians, member of Sigma Xi and holder of certificate by the American Board of Internal Medicine. A previous contribution to JOURNAL-LANCET was on the early history of medicine in Montana.

Dr. George N. Aagaard, B.S. and M.B. as well as doctor of medicine (all degrees from the University of Minnesota) is assistant professor in the department of medicine at that institution. Half of the period since his graduation in 1937 has been spent in practice in Minneapolis where he is affiliated with the University hospitals. Besides county, state and national medical society memberships Dr. Aagaard belongs to the American Heart Association and the Minnesota Pathological Society.

Captain Jack L. Diamond, Fargo, North Dakota, graduated from the University of Nebraska in 1934 and after post-graduate work in courses of the American College of Physicians and "military medical" he became a member of the staff of the United States Veterans Administration Facility. He has been in the army for something over three years.

Dr. Paul P. Ewald, Lead, South Dakota, is a past president of the Black Hills district medical society, one of the most active bodies in the state. He graduated from the medical school of the University of Kansas in 1918. His last paper in this journal was published early in this year.

Dr. Morse J. Shapiro, Minneapolis, clinical head of the Children's Heart Hospital and Clinic, finds in the new projected heart center (mentioned in the editorial of Dr. A. E. Hedback and the transcript of the address of Dr. Cecil J. Watson elsewhere in this issue) the outgrowth of twenty-five years of effort. Dr. Shapiro is a product of the University of Minnesota medical school—class of 1917—with a record of graduate work done at that institution in 1928 and 1929 and in Europe in 1925 and 1930. He has practiced in Minneapolis continuously since receiving his degrees, instructing at the university under an assistant professorship. He holds membership in the Minnesota Society of Internal Medicine, Central Society for Clinical Investigation, American Heart association and American Rheumatism association and is a diplomate of the Board of Internal Medicine. He has contributed to our pediatric issues.

Dr. James L. Wilson, Ann Arbor, Michigan, is consultant on respirators for the National Foundation for Infantile Paralysis, associate editor of the American Journal of Diseases of Children, Bellevue professor of pediatrics on the University of Michigan staff and chairman of the Department of Pediatrics

and Communicable Diseases at University hospital, Ann Arbor. Dr. Wilson, 1926 graduate of Harvard University medical school and for eleven years intern-resident on the Harvard faculty, has served as associate professor and professor of pediatrics at Wayne University, New York University and the University of Michigan. He likewise went from assistant director to director of the Children's hospital of Detroit in the course of a five year service and was chief of the children's service at N. Y. U. during his professorship there. Dr. Wilson's memberships, besides state medical society, are in the Society of Pediatric Research and the American Pediatric society.

Dr. Cecil J. Watson, professor of medicine and head of the Department of Medicine at the University of Minnesota medical school, one of the first trustees of the Minnesota Medical Foundation, is also consultant to the office of the Surgeon General and secretary on the Committee on Practice of Medicine of the American Medical Association. After noting his membership and services in one office or another of fourteen or fifteen state and national medical and scientific societies the editorial investigator stopped counting.

MEMORANDUM From the Secretary's Office, American Student Health Association

Dr. Ruth Boynton, chairman of the committee to Coordinate War Efforts, American Student Health Association, conferred on May 18th with Charles M. Griffith, medical director of the Veterans Administration. This conference considered the adoption of a policy by the Veterans Administration for the treatment of veterans pursuing a course of vocational training.

On July 24th, Frank T. Hines, administrator of the Association, sent out the following directive:

"Reference is made to Public Act 16, 78th Congress, under the authority of which beneficiaries of the Veterans Administration are pursuing a course of vocational training at various educational institutions throughout the country.

Inasmuch as such trainees are entitled to medical care for the purpose of preventing an interruption of training, and as it is believed advisable that every effort should be made to keep veterans in training to the fullest extent possible, it is desired that medical or hospital care for illnesses of relatively short duration be provided by the institution, if available.

Accordingly, it is requested that institutions with which contracts have been made for vocational training under the provisions of Public Act 16, 78th Congress, be required to furnish your office a statement indicating the nature and extent of medical services available through payment of the health fee, and a statement of medical services available and the fees charged therefor, which are not covered by the health fee.

The statement of medical services available and the fees to be charged for such services not covered by the health fee should be accepted as a supplement to any contracts now in effect with the institutions covering vocational training under the provisions of Public Act 16, 78th Congress. Immediately after the supplements to the contracts have been approved, you will authorize the institutions to provide medical care of the nature covered by the supplements as required to those trainees, listing them by name, already enrolled, and will issue a similar authority for each trainee subsequently enrolled, these authorities to remain in effect as long as the trainees covered thereby are enrolled at the institutions.

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HEART HOSPITAL

There is a movement on foot, sponsored by the Variety Club of the Twin Cities, to erect a \$325,000 structure on the medical campus of the University of Minnesota, to be known as the Variety Club Heart Hospital of the Northwest.

It is an alarming fact that heart disease has become the greatest killer of man today. It has shown itself to be an even greater scourge than global warfare. Statistics compiled by Dr. H. S. Diehl, dean of the medical sciences, University of Minnesota, show that 227,097 American boys were killed in action in army and navy service during the first two and a half years of the war, while during this same period approximately 1,000,000 persons died from heart disease in this country. Though children afflicted with rheumatic fever may recover from the acute attack, the majority are crippled for life by consequent heart impairment, and their life spans short-

ened. Yet nowhere has a coordinated program for the study and treatment of rheumatic fever been established. With but one exception there is not an institution on the entire continent of North America devoted to the treatment of heart disease, the single exception being one in Mexico City.

This Variety Club Heart Hospital of the Northwest would, therefore, be the first concentrated onslaught on the number one cause of death in the United States. The research facilities at the University of Minnesota will provide cooperation of all phases of medical science. Not only will it be possible to study rheumatic fever and its effect in childhood but all phases of cardiac disease in adults including surgical technic, when such procedure is indicated. Minneapolis will be known not only as the Flour City at the head of navigation on the Mississippi but also as the heart capitol of the nation.

A.E.H.

POLIOMYELITIS

In the August number of this journal appeared an article by Dr. John F. Pohl entitled "The Kenny Concept and Treatment of Infantile Paralysis," in which he discussed the use of the respirator in acute poliomyelitis. He states that in his clinic twenty-three deaths from poliomyelitis have occurred in the past five years and that only thirteen patients have been placed in a respirator and none survived after being placed there. He obviously disapproves of its use.

Death in this dreaded disease seems greatly overshadowed in importance by the tragic, permanent crippling that so much more often occurs. It is perhaps not surprising, therefore, that the details of the treatment of the types of poliomyelitis usually fatal are unfortunately underemphasized and little understood. Much confusion about the use of the respirator, about the term bulbar poliomyelitis, about the different mechanisms that interfere with respiration, is apparent throughout the country. The recent article by Doctor Pohl adds to that confusion. Many of us who have watched the prolongation indefinitely of the life of hopeless cripples may have wished that the respirator had not been invented. It is here, however, and saves life, often a worthwhile life, and anyone undertaking to care for poliomyelitis patients should understand its use. Proper treatment of patients with respiratory muscle paralysis, however, is actually much less important than those with pharyngeal paralysis with which the first is often confused as these are more common and if they survive offer a far better ultimate prognosis.

Quite apart from the criticisms offered by Doctor Pohl, the greatest harm seems to have been done by the fact that the indications for the use of the respirator have not been recognized clearly. Respiratory distress leading to death can be caused by (1) paralysis of the essential muscles of respiration, the intercostal muscles, and the diaphragm, for the relief of which the respirator, or "iron lung" is specific though, of course, not curative; (2) paralysis of the pharynx, where a great deal can be done to save life but where the respirator does harm, and (3) dysfunction of the medullary vasomotor and respiratory centers where little at all can be done to help, although the respirator occasionally may be of some aid. Unfortunately, paralysis of the essential respiratory muscles has not been usually differentiated from dysfunction of the cerebral respiratory centers and from the effects of pharyngeal paralysis, and indeed, on occasion this differentiation is exceedingly difficult as any two or all three of these factors at times may be simultaneously present.

It is impossible to take space to analyze and answer in detail Doctor Pohl's paper which follows accurately the Kenny philosophy and indeed seems to this writer to be more philosophy than physiology or anatomy. One can, perhaps, get a fair point of view of the Kenny concept from such a paragraph as this: "The Kenny methods are not primarily concerned with muscle strength, as this factor is of little importance in the restoration of the body to functional activity. It is common to see Kenny-treated patients walking without the use of braces

and with a rhythmic gait in spite of marked loss of muscle power in both lower extremities." It is apparent that an emotional, ostrich-like attitude towards paralysis exists in Doctor Pohl's mind. Most of us will be far more demanding in our criteria for success in treatment than those who are satisfied in seeing children walking with a rhythmic gait without braces. We want to see them running up stairs, two steps at a time, and kicking footballs. No present method of therapy, "orthodox" as Miss Kenny calls it, or her own, can "cure" this disease, but if the casual attitude toward paralysis expressed by Doctor Pohl is taken toward paralysis of the intercostal muscles and the diaphragm, it is to be expected that fatalities will result.

It is not clear what sort of patients were placed in respirators in Doctor Pohl's clinic. It is stated that the thirteen patients treated in a respirator all died. There is no reason for a patient with paralysis of the intercostal muscles and the diaphragm to die from the effects of these palsies when properly treated in a respirator. Death, when it occurs, must be due to bulbar involvement, to aspiration due to pharyngeal paralysis, to pneumonia, to secondary infection, or to exhaustion when the respirator is used tardily. It is hard to understand the terribly bad results reported unless the respirator was misused or the choice of patients bad or unless, by extraordinary chance, there were no patients with respiratory muscle paralysis uncomplicated by bulbar symptoms in his series.

Doctor Pohl states that the respirator causes "hardening" of the chest muscles, a curious effect hard to interpret and one that this writer has not observed. He also mentions that constant lifting of the rib cage by the respirator causes the lower ribs to become permanently elevated or splayed. This is indeed often the case in diaphragmatic paralysis, a paralysis which Doctor Pohl does not mention but which, when it occurs, of course inevitably allows the lower ribs to flare. It is one of the less important prices that the severely paralyzed patient pays for a continuation of life.

It seems very unfortunate that in order to rationalize the excellent muscle training techniques of Miss Kenny, so many pseudo-scientific theories should have been evolved and pressed to their illogical conclusions. That so much preoccupation with these theories by well trained physicians should have occurred is a curious phenomenon in American medicine. It is mysterious by what confusion of anatomy the muscles of the neck supposedly in "spasm" can be thought to inhibit or "alienate" the intrinsic muscles of the pharynx. The hot pack applied with such fetish-like details by the Kenny disciples often gives great comfort and, at its worst, is usually only annoying except in those cases where there is serious respiratory difficulty. Treatment of these patients (patients with pharyngeal paralysis) is a problem where any but the most skillful, gentle and logical handling can do immense harm. Certain very simple but extremely important therapeutic steps need to be followed and these steps easily can make the difference between life and death. This is no place to detail such treatment, but the all-essential features are to give postural drainage and

to learn to aspirate the throat with the minimum of excitement, because it is the high-strung, excited, nervous child that thrashes himself to death with fatigue and exhaustion from attempts to breathe with every inspiration continually interrupted by choking. With many patients it is of utmost importance to avoid excitement or any unnecessary disturbance. Although wrapping hot blankets around the patient's neck may not harm him and may occasionally relieve some neck pain, it is apt to be carried out in a way to seriously prejudice the child's outcome, particularly when it is made the primary part of the treatment and when attempts to feed the child and gavage him are made during the acute stage and aspiration of the throat neglected or done poorly. The respirator itself, when applied to such children whose illness is not clearly complicated by diaphragmatic and intercostal muscle paralysis, adds to the confusion and the harm that so frequently results. The mortality that Doctor Pohl reports of about six per cent is not an unusual hospital mortality in poliomyelitis, but it is certainly not one that can in any way be used as an argument for any new form of therapy or for neglect of the respirator which, when properly used, gives dramatic relief from fatigue in even mild respiratory muscle paralysis.

JAMES L. WILSON, M.D.,
Professor of Pediatrics and
Communicable Diseases,
University of Michigan,
Ann Arbor, Michigan

"THE CONSTANT INVADER" ON THE AIR NOVEMBER 3

Announcement is made by Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association, that the use of radio on a nation-wide basis for health education will be attempted by the National Tuberculosis association for the first time this fall when "The Constant Invader," a series of thirteen recorded dramatic shows, goes on the air from coast to coast. It is sponsored by the Christmas seal organizations of the state.

The program, presented over WCCO every Saturday at 4:45 P.M. for thirteen weeks, runs from November 3. The entire series deals with tuberculosis control and is narrated by Dr. A. J. Cronin, author of "Hatter's Castle," "The Keys of the Kingdom," and "The Green Years."

Dr. Cronin's next book is to be about a man engaged in tuberculosis research.

Another broadcast in the series deals with advances in medicine and surgery for the treatment of tuberculosis. It gives the historical background of the tuberculosis campaign, dramatizing Laennec's invention of the stethoscope, Koch's discovery of the tubercle bacillus, Roentgen's discovery of the x-ray, and Trudeau's discovery of the rest regime.

Included in the thirteen broadcasts is a play which dramatizes the role of the family doctor in the tuberculosis campaign. It tells the story of one family doctor who solved the mystery of positive reactions among members of a family.

The broadcast on medical research dramatizes the long-range experiments of Professor Rudolph Anderson of Yale university on the chemical analysis of the tubercle bacillus.

Other subjects included in the series are: the ways in which community agencies work together toward the solution of the TB problem, the work of the public health nurse in a rural community, tuberculin testing in schools, an industrial x-ray survey, the necessity of examining family contacts, modern sanatorium care, a typical college health program, tuberculosis as a problem among old people, the value of rehabilitation, and health education.

Book Reviews

Radio in Health Education, a symposium prepared under the auspices of the New York Academy of Medicine. New York: Columbia University Press, 120 pages including index and appendices; 1945, price \$1.60.

While in no sense a handbook on how to conduct a radio program, this stimulating, provocative volume, the first in a series devoted to public health education, does suggest several ways to use radio more effectively. For instance, the doctor should talk to his listeners rather than to the subject. Although his mind may be on heart disease, cancer or diabetes, to have a good radio personality the doctor must make each listener feel that the listener is being uniquely addressed.

Radio is a frontier land for health education; its value is still to be realized. This book presents a critical evaluation of objectives and techniques. The first part of the book is a report of a survey made by the New York Academy of Medicine; the second part consists of papers presented at the Academy's 1943 Health Education conference. Contributors include Doctors Arthur F. Chace, Donald B. Armstrong, Iago Galdston, Alan Gregg and Ernest L. Stebbins; radio executives Frank Ernest Hill, Willard D. Egolf, Lyman Bryson, Miller McClintock, and Leon Goldstein; Paul F. Lasarsfeld and Patricia Kendall of the office of radio research, Columbia university; and Philip H. Cohen, formerly with the office of war information.

Fertility in Women, by SAMUEL L. SIEGLER, M.D., attending obstetrician and gynecologist, Brooklyn women's hospital; attending gynecologist, Unity hospital; attending gynecologist, sterility clinic, Greenpoint hospital; consultant in gynecology, Rockaway Beach hospital, New York. Philadelphia: J. B. Lippincott Co., 450 pages with 194 illustrations, 1944, \$4.50.

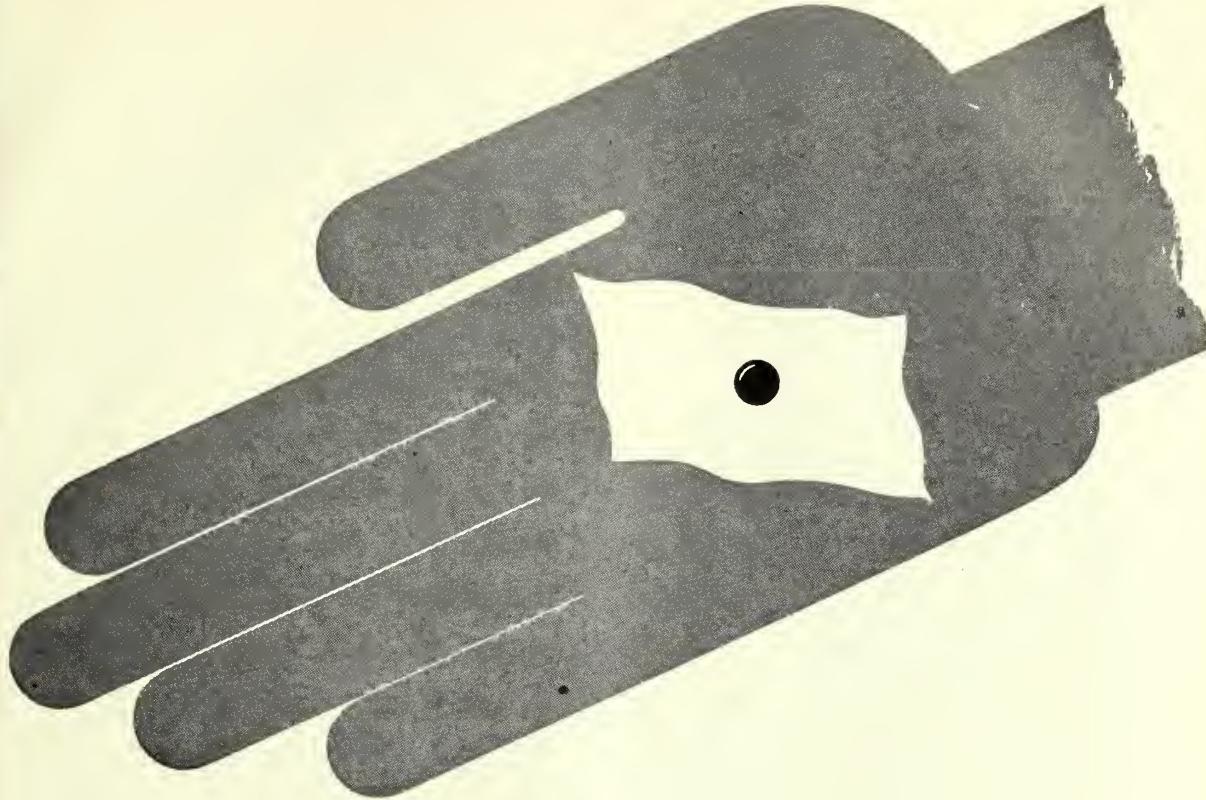
Fertility in Men, by ROBERT SHERMAN HOTCHKISS, M.D., assistant professor of urology, New York University medical college; instructor in surgery (urology), Cornell medical college; assistant visiting attending physician, Bellevue and New York hospitals, New York. Philadelphia: J. B. Lippincott Co., 216 pages with 95 illustrations, 1944, \$3.50.

These two companion volumes summarize the literature and the authors' experience in diagnosis and treatment of infertility in the male and female.

In the longer book, dealing with fertility and sterility in the female, the writer presents all that is known in this field in a detailed manner for practical use and guidance of the practitioner. The text concludes with a chapter dealing with the intrinsic and extrinsic factors and the treatment of abortion.

The shorter volume presents the author's studies and the results in treatment of numerous cases, together with detailed methods of treatment to assist the practitioner.

Both authors emphasize the importance of careful clinical and laboratory examinations as a guide toward diagnosis and the subjects are written in clear and readable style.



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News Items

Mrs. Baughman, Madison, South Dakota, past president of the Women's Auxiliary to the South Dakota State Medical association, sends this encouraging reply to inquiry about the health of Dr. Daniel S. Baughman, past president of the State Medical association: "Doctor is gaining every day and helping his partner a little, but is not strong enough, really, to go back into practice. He feels fine but tires easily." Dr. Baughman's legion of friends trust he will be completely restored shortly.

The Yankton District Medical society, one of the most energetic in South Dakota, met September 20 at Yankton with fifty present and heard Dr. Herbert C. Leiter, of Sioux City, Iowa, on "Diagnosis, Etiology, and Management of Some Common Skin Disorders in General Practice" and Dr. W. L. Meyer of Sanator, South Dakota, on "Diagnosis and Post-Sanatorium Treatment of Tuberculosis." Dr. Meyer is superintendent of the State Tuberculosis hospital at Sanator.

Dr. John F. Briggs, St. Paul, Minnesota, successfully passed the written examination for Fellowship in the American College of Chest Physicians held in June 1945, and will be awarded his fellowship certificate at the next convocation of the college. The convocations are held in conjunction with the annual meetings of the college which will be resumed again in 1946.

The Fergus County Medical association of Lewistown, Montana, at its September meeting, welcomed back Major Paul Gans, and Captain Raymond Eck, recently released from the Army Air Forces, who will resume practice at Lewistown. The association discussed the proposed Montana prepayment plan for medical care. It was the general opinion that the fee schedule would not be sufficient to pay in full for services rendered.

Dr. Fred F. Attix, secretary of the society, made some comments about the American United National broadcasting program of Sunday, September 16, 1945, in which CIO representatives stated they were supporting the passage of the Wagner-Murray-Dingell bill with their five million-strong membership, and that all other union organizations were in favor of the proposed measure. Mr. Dingell had stated that all medical men who opposed this measure were "reactionaries" and denied that the measure was socialistic. Dr. Attix asked the rhetorical question of whether doctors are so gullible.

Dr. Attix further stated that the present bill is more extensive and pernicious than the former Wagner-Murray bill and will prove to be detrimental to medical progress and achievement, and not in accord with the American way of life. He suggested that action on the consideration of this measure be delayed until such time as the many doctors in the services return to their private practices and have an opportunity to state their opinion. He also suggested that all the various local American Legion posts be communicated with and their members informed that the returning service men will

be taxed, four, eight and twelve per cent on their earnings, depending on the amount of salary they receive, and that their support be enlisted against the bill. They now are entitled to receive service at all veterans hospitals without cost. Numerically they are strong and such a united front could do much to offset the CIO support. President Graham of A. F. of L. of Montana is opposed to the bill.

Regimentation of 150,000 disgruntled doctors, if the bill becomes a law, would undoubtedly prove to be a real menace to all free enterprise and aid materially in advancing our future governmental policies toward a generally socialistic scheme. Said Dr. Attix, "You cannot be half slave and half free. This will prove to be the keystone to an arch of socialism. Let us put a stop to bureaucratic control."

On Thursday, August 23, United States Senator Burton K. Wheeler addressed the Silver Bow County Medical association at a dinner meeting at Butte. From an excellent talk the substance of his remarks follows:

He expressed himself as opposed to the Murray-Wagner-Dingell bill and believes that it has not the slightest chance of passing. He believes that doctors who work for the government under a form of socialized medicine would give most of their consideration to drawing salaries and not to the patients and that most of these doctors would be those who could not make a living in private practice. He said this simply reflects human nature, and that just as competition is the life blood of General Motors vs. Ford, it is also the life blood of doctors. He cautioned the doctors, however, to be watchful and diligent in keeping up with the times, with the public, and especially with medical knowledge.

Grand Forks District Medical society held its September meeting at Grafton, North Dakota, and was addressed by Dr. J. O. Swanson of Fargo on "Internal Fixation of Fractures" demonstrated by x-ray photographs. Guests present were Captains John Gislason and Louis Silverman.

Cass County Medical society of North Dakota met at Gardner Hotel, Fargo, for its September meeting with forty in attendance. Dr. F. L. Wicks, of Valley City, recently retired past president of the North Dakota state association, spoke on the governor's health planning committee. Dr. L. W. Larson, secretary of the state association, gave a survey of medical activities in the state and the status of medical care in North Dakota. A special committee of six appointed to study the aspects of the prepayment plan for the Cass County area, recommended that a procedure be initiated under the sponsorship of the society to include surgical, obstetrical and fracture benefits only, under the name "A Physician's Service Plan." The recommendation was acted on favorably.

On October 3, Lt. Col. Frank B. Queen, chief of laboratory service of Bushnell hospital, Brigham, Utah, spoke to the Silver Bow County Medical association at Butte, Montana, on "Infectious Hepatitis," illustrated with colored slides and motion pictures.

(Continued on page 410)



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NEWS ITEMS (Continued from page 408)

The Fourth District Medical society of South Dakota met at Pierre, on October 15, and heard Dr. A. V. Stoesser of Minneapolis on "Rheumatic Fever, Its Etiology, Diagnosis, Prognosis, and Treatment." The lecture was illustrated with lantern slides. At a clinic held at St. Mary's hospital a few hours earlier under the auspices of the county division of maternal and child welfare of the State Board of Health, Dr. Stoesser had spoken on the same subject, presenting cases and leading the discussion.

From the 32nd Infantry division on northern Luzon comes word that Captain Edgar G. Ingalls, Jr., of Minneapolis, commanding officer of Company D, 107th Medical battalion—clearing station and hospital for the 32nd Infantry division, has just been awarded the Bronze Star medal for "heroic achievement" in connection with operations against the enemy in the battle of Leyte on November 19, 1944, while in command of Company E of the same battalion.

On the occasion mentioned, Captain Ingalls, whose medical unit was stationed near Pinamopoan Point and had become subject to devastating machine-gun fire during its operations, courageously effected the rescue of a wounded soldier in an exposed position and rendered him necessary medical attention. With further resourcefulness and vigor Captain Ingalls organized and directed evacuation teams for the removal of litter patients to a point of safety until he was finally able to effect the withdrawal of his unit.

Going overseas on August 1, 1942, Captain Ingalls joined the division in November of that year and has participated in all of its campaigns, on the famous "road back" in the bitter jungle fighting of Buna, Saidor, and Aitape, through the wild Ormoc road of Leyte and finally in the epic struggle along the Villa Verde trail of northern Luzon.

Captain Ingalls is the son of Mr. Edgar J. Ingalls, 1720 W. 31st St., Minneapolis. He secured his M.D. and bachelor's degree at the University of Minnesota in 1941 and left his practice in Minneapolis when activated at the beginning of the national emergency.

Col. George F. Schmidt and Major Hamlin Mattson, Minneapolis, have been honorably discharged from the army medical corps and have resumed their practice in Minneapolis.

Dr. N. O. Pearce, Minneapolis, has been appointed tuberculosis control officer of the Minnesota department of health and will direct the state-wide tuberculosis control program made possible by the recent allocation of approximately \$100,000 to the Minnesota department of health by the tuberculosis control division of the United States public health service.

Dr. M. I. Hauge of Clarkfield has accepted a year's residency at Abbott hospital, Minneapolis. Dr. M. A. Borgerson of Hanley Falls will move to Clarkfield and take over Dr. Hauge's practice.

Dr. Norman Lende has returned to Faribault to the practice he left when assigned to the Panama Canal Zone.

Dr. Martin A. Ruona, Sandstone, physician, surgeon, psychiatrist and administrative officer with the United States public health service for the past nine years, has joined the staff of Shipman hospital at Ely.

Dr. R. R. Hendrickson, Lake Park, has returned to take charge of the Sand Beach sanatorium after a leave of two years during which he served as surgeon in reserve in the United States public health service.

Dr. William A. O'Brien of the University of Minnesota is now at work organizing a staff for a "refreshment center" to be opened in October or November for physicians returning from service and feeling the need of further medical work. The center was made possible by a grant of \$250,000 from the W. K. Kellogg foundation presented for this purpose.

Dr. Harlan A. Alexander, Minneapolis, captain in the medical corps and battalion surgeon through four Pacific campaigns, is home on leave with the army's bronze star and oak leaf cluster.

Dr. I. H. Mauss, director of Pennington county (South Dakota) health department, reported a total of seventy-four children attending five pre-school clinics, all but six of whom needed correction of an ailment or inoculation against disease. Fifteen had a positive test for pinworms, fourteen required attention for tonsils.

Dr. Emanuel M. Josephson, New York physician, was awarded a \$19,500 verdict in a federal court damage suit for false arrest instituted a year ago at Rapid City, South Dakota. The doctor contemplates further litigation in the same court for \$100,000.

Watertown, South Dakota, has been visited by an agricultural association agent in the interests of the medical service provided by the government for government contract laborers. The service now extending over fifteen states is a branch of the department of agriculture.

Dr. Harry V. Gibson has been reappointed, for four years, city-county health officer at Great Falls, Montana.

Miles City, Montana, will have a million-dollar 100-bed veterans' hospital and provision has been made for a hospital at Minot, North Dakota. The Fort Harrison hospital at Helena, Montana, is being considered as one of a number which it is proposed to expand.

The Montana Tuberculosis association met September 8 at Helena with Dr. E. M. Larson of Great Falls, president, in the chair. Dr. Larson was re-elected for a one-year tenure. Speakers from Denver, Portland and Chicago were heard. Dr. J. L. Mondloch, Butte, described the new tuberculosis case-finding program of Silver Bow county.

Dr. William M. Ross has joined the staff of the Bartron clinic, Watertown, South Dakota.

Colonel Alan Challman, after three years in the Pacific (Australia, New Guinea and the Philippines) as head of the psychiatric division of the Army under General MacArthur, setting up hospitals and training staffs, visited his sister in Minneapolis, where he was director of the board of education's child study department prior to enlistment in 1941.

Dr. Henry Silver of Sebeka, Minnesota, after five years is leaving for Culver City, California.

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Literature and Sample on Request

Future Meetings

The University of Minnesota announces the first of a series of continuation courses in pediatrics for pediatricians November 7, 8, 9, 10. Faculty for the first course will include Irvine McQuarrie, department of pediatrics, medical school; Henry F. Helmholz, department of pediatrics, Mayo foundation; Helen Brooke Taussig, Johns Hopkins University school of medicine; Hugh McCulloch, Washington University school of medicine; Milton J. E. Senn, Cornell University medical college; Charles Anderson Aldrich, Mayo foundation; and members of the faculty of the medical and graduate schools of the University of Minnesota (Minneapolis, St. Paul, and Rochester).

Subjects: Convulsive Disorders; Child Psychiatry; Psychologic Measurement; Speech Problems; Psychosomatic Pediatrics; Physical and Mental Development; Congenital Heart Disease; Rheumatic State and Acquired Heart Disease. Lectures, clinics, demonstrations, and conferences will be held each day from 9:00 until 12:30 and from 2:00 until 5:00 o'clock, except on the last day when the sessions will close at noon. (Two evening sessions.)

Total fee, \$20. \$3 registration fee should accompany application to Center for Continuation Study, University of Minnesota, Minneapolis 14, Minnesota. Balance of tuition will be paid on the first morning of the course. Residents, fellows, and men in the military service will be admitted without the payment of registration or tuition fees.

Living accommodations are provided at the Center for Continuation Study.

The University of Minnesota and the University of Illinois have been established as two of the principal centers for the "refresher" training of physicians who have been in military service to refit them for civilian practice through a gift of \$250,000 from the W. K. Kellogg Foundation to be used in that way over a period of five years.

The training was launched to help fill needs revealed by a survey of 21,000 doctors in uniform. Sixty per cent said that on demobilization they wished to take long-term courses leading to specialization, and more than one-fifth wanted short "refresher" courses.

At Illinois new students can start the work at the beginning of any month. Enrollment is limited to 40 at one time. Veterans will be given preference in enrollment, but civilian doctors also are eligible.

The training at Minnesota will consist of three eight weeks periods or blocks of courses, generously supplemented by work in hospitals with actual patients. Courses will be in the Center for Continuation Study and at the Medical school. Ancker hospital, St. Paul, will provide most of the hospital service, although lesser programs will be carried out at University and Minneapolis General hospitals. It is expected that before the program expires it will be one of the earliest activities in the prospective Mayo Memorial building.

The refresher training will be under the general supervision of Dr. William A. O'Brien, success of whose program of courses in continuation was a principal reason for the large grant to Minnesota.

Necrology

Dr. John Chandler Sessions, 66, Minneapolis, died October 19 at Minneapolis. Born in Kansas, Dr. Sessions came to Minneapolis fifty years ago, attended that city's schools and graduated in 1902 from the University of Illinois. He ranked a lieutenant-colonelcy at the close of World War I. He had been on the staff of Eitel hospital, Minneapolis.

Dr. Milton S. Fischer, 34, Minneapolis, died October 10 at Swedish hospital, Minneapolis, two hours after a sudden heart attack. A native of St. Paul and educated in its public schools and University high school, Dr. Fischer attended also Union college, Lincoln, Nebraska, and was a graduate of the College of Medical Evangelists at Loma Linda, California.

Dr. Walter Volke, 35, Coleraine, Minnesota, died at Billings hospital, Chicago, October 25. He was born at Bovey, Minnesota, had resided in Chicago and retired from practice.

Advertisers' Announcements

SIR ALEXANDER FLEMING HONORED GUEST ON JULY 3 SCHENLEY RADIO PROGRAM

Sir Alexander Fleming, discoverer of penicillin, is among the outstanding men of medicine appearing as distinguished guests in the radio series, "The Doctor Fights," Schenley Laboratories program which dramatizes episodes of medical heroism and achievement on battle fronts, aboard fighting ships and in the laboratories and hospitals where crucial victories in the field of medicine and surgery have been won. Each week, the doctor whose real-life achievements provide the theme for the broadcast participates as guest of honor.

Sir Alexander came before the microphone in July when the radio series re-enacted the dramatic events leading to the world famous British scientist's first realization that something secreted by an unwanted mold was mysteriously dissolving cultures of deadly bacteria in his London laboratory.

Sir Alexander predicted that "we are only at the beginning of this great study." Referring indirectly to the once momentous problem of producing penicillin in quantities sufficient to save human life, he expressed his own high tribute to the American scientists and manufacturers whose achievement of mass production has saved thousands of lives in war and at home.

Sir Alexander's address was his first introduction to an American radio audience. A dramatization, re-titled, "The Magic Drug," was built around his discovery of penicillin and the life story of Dr. Fleming, whose part in the radio play preceding the address was portrayed by Ronald Colman, British-born celebrity of the theater.

Classified Advertisements

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Minneapolis doctor offers for sale Castle electric sterilizer, 16 inches long, in good condition (merely needs polishing). A buy at \$30. For further information address Box 826, care of this office.

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Aznoe's, established in 1896, has available a number of well trained physicians (diplomates of the specialty boards, industrial physicians and surgeons, general practitioners, psychiatrists, tuberculosis specialists and residents). For histories, write Ann Woodward, Aznoe's-Woodward Medical Personnel Bureau, 30 North Michigan Ave., Chicago 2, Ill.

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Deceased doctor's medical equipment consisting x-ray; fluoroscope; excellent condition; also table and bucky; first class diathermy; lead gloves, heavy rubber gloves, developer, developing tank; two infra-red lamps. Also complete equipment for testing and treating eyes—up to date. Eight-bulb cradle lamp; suction pump; doctor's bag (new); instruments; splints and belts of various types, sizes. To be seen by communicating Mrs. Edith Watson, Browns Valley, Minnesota, or call Bernice Bates at Main 7974, Minneapolis.

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Physician for general practice and obstetrics, also to assist in surgery in Minneapolis. Good opportunity for diagnostic training. X-ray facilities and complete clinical laboratories. State school, year of graduation and internship. Address Box 828, in care of this office.

ENTER "GERIATRICS," A BIMONTLY

A new bimonthly medical journal, GERIATRICS, devoted to research and clinical reports on the processes and the diseases of the aged and aging, will appear in January, Modern Medicine Publications announces.

For some time the need for a journal of this type has been increasingly apparent. The field among patients of fifty and over is growing steadily. By 1975, it is estimated that 40 per cent of our population will be in that group. Whatever information serves to increase the life span of the individual, whether a matter of diagnosis and treatment, surgical intervention or proper nutrition, is very much in accord with the thinking of the times. The editorial direction of Geriatrics will stress the investigations and advances made in the study of geriatrics and report on the clinical applications of new developments.

The editor is Dr. A. E. Hedback, who has been the editor of Modern Medicine since its inception. The editorial board serving with Dr. Hedback consists of a group of distinguished medical authors and editors, specialists in the field of geriatrics.

Research Animals Travel by Air

The hamster, a rodent, has joined the odd fraternity of animal life that has been flying the air express routes in the interest of science. A shipment of six hamsters has been air expressed by the University of Colorado to the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. They will be used in cancer research. Scientists consider hamsters better than rats or guinea pigs for experimental purposes, because they are more susceptible to human diseases.

News Items

Dr. B. A. Bobb, Mitchell, South Dakota, has retired after more than fifty years as practicing physician and surgeon. His practice will be taken over by his nephew, Dr. Edward Bobb, son of Dr. C. S. Bobb, who continues as senior member of the partnership.

The North Dakota State Medical association has gone on record as favoring the appointment of Capt. Watson B. Miller, Washington, D. C., as federal security administrator, succeeding Paul V. McNutt.

Dr. B. W. Friedland, Watertown, South Dakota, will locate in Lakota, North Dakota. Dr. F. C. Kohlmeyer, who has been the only physician at Lakota and in all of Nelson county as well, has closed his office and will study at Washington university.

A new Public Health Center, representing a consolidation of health services in the city, has been opened at 240 South Fourth Street, Minneapolis.

Dr. H. B. Frock, Lemmon, South Dakota, has taken a year's leave from practice for health reasons. His of-

fice has been taken over by Dr. T. O. Sandbo, pioneer Lemmon physician, who has returned to practice.

Dr. J. Horton Daniels, Minneapolis, medical missionary at the University of Nanking until late in 1941, will return to China late in 1945. In the interim he has been with the Students' Health Service, University of Minnesota.

Doctors returning to practice from the armed services include Lt. Col. A. C. Johnson, Great Falls, Montana; Capt. Ray Eck, Lewistown, Montana; Dr. Ralph Vinje, Beulah, North Dakota; Capt. Paul Cook, Valley City, North Dakota; Capt. Harry O. Anderson, Wichita, Kansas; Capt. L. V. Berghs, Owatonna, Minnesota; Dr. Carl H. Winquist, Crosby, Minnesota; Dr. P. J. Pankratz, Mountain Lake, Minnesota; Dr. P. S. Rudie, Duluth.

Dr. and Mrs. H. A. Miller, Fairmont, Minnesota, have returned from a three-year residence in Monroe, Georgia, where Dr. Miller was manager of a hospital.

Dr. Orville H. Jones, formerly of Madison Lake, Minnesota, has opened new offices in Mankato.

Dr. A. R. Ellingson, Detroit Lakes, Minnesota, has resumed practice following an illness and convalescence spent at his cottage on Bad Medicine lake.

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ETHICALLY PROMOTED

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The JOURNAL LANCET

Minneapolis, Minnesota
December, 1945

Vol. LXV., No. 12
New Series

Proceedings of the Council Meeting of the AMERICAN STUDENT HEALTH ASSOCIATION Hotel Nicollet, Minneapolis, Minnesota May 2-3, 1945

The Council Meeting of the American Student Health Association was called to order by the president, Dr. Ralph Canuteson, at the Hotel Nicollet in Minneapolis, Minnesota, on May 2, 1945, at 10:00 a.m.

The minutes of the last meeting, held in Cincinnati, Ohio, March, 1944, were read and approved.

The treasurer's report was read and accepted.

An application for membership in the Association was received from the University of Alabama and passed on favorably.

During the past year, letters of inquiry have been received from the University of Alabama, University of Colorado, Connecticut College, University of Delaware, and the University of British Columbia asking about the organization of Health Service Work, infirmary buildings and development of new phases of student health care.

Dr. Boynton suggested that our organization keep, in its files, up-to-date information on floor plans for infirmaries as well as printed material dealing with various phases of student health services that would be helpful to schools organizing new services.

It was moved by Dr. R. W. Bradshaw and seconded by Dr. Glendine Snow that each school should be asked to send in an annual report to the American Student Health Association summarizing the information frequently requested by letters of inquiry. The secretary was authorized to construct a questionnaire, to be sent out with the bills, to secure the desired information.

A list of schools whose dues are delinquent was read. After some discussion, it was decided on the motion of Dr. Warren E. Forsythe, and seconded by Dr. J. P. Ritenour, that schools whose dues were delinquent for two years should be offered suspended membership status for a one-year period if they desire to renew active status after the war. The secretary was asked to write to the presidents of the various colleges concerned offering this proposal.

Subscriptions to the JOURNAL-LANCET should not be paid for by our association for the period of suspended membership.

Drs. L. B. Chenoweth, Warren E. Forsythe and Ruth Boyn-

ton were named by the president as a nominating committee to nominate a new secretary-treasurer.

At the luncheon meeting, 12:15 p.m., Mr. Cohen of JOURNAL-LANCET gave an interesting picture of the publication and sketched the relationship of the American Student Health Association to the Journal as our official publication.

Mr. Cohen pointed out the desirability of a good public relations program of publicity for our organization and made some suggestions for obtaining it.

The afternoon was devoted to tours of the health services at the school of agriculture and the University of Minnesota. Tea was served for the council members and health service staff at the University Health Service building.

Dr. J. A. Myers and Dr. Charles E. Lyght discussed problems in the control of tuberculosis at the dinner meeting at 7:00 p.m.

The importance of tuberculin skin testing was stressed by Dr. Myers.

Thursday, May 3, 1945

The business meeting was called to order at 10:00 a.m. to hear the president's address read by Dr. Ralph Canuteson (full text reported elsewhere in minutes).

The physical fitness programs being developed throughout the country were discussed in some detail. The importance of college health services establishing real leadership in the post-war physical fitness programs was stressed.

Dr. Ruth Boynton reported on the joint committee activity in publishing a handbook sponsored by the American Medical Association, National Education Association, Association for Health Physical Education and the American Student Health Association. This handbook, to be placed in all the colleges and universities, will cover many aspects of physical fitness

It was moved by Dr. Ruth Boynton and seconded by Dr. C. E. Lyght that the American Student Health Association go on record as stating that college health services are concerned with medical examinations and medical care of students, and with their health education and health supervision and that this

association urge that these aspects of physical fitness be emphasized in whatever program is evolved for post-war promotion.

Reports of the council committees were presented and accepted. Full texts of the reports will appear in the JOURNAL-LANCET.

Dr. George T. Blydenburgh was elected secretary-treasurer to succeed Dr. Helen B. Pryor, who has resigned to return to private practice of pediatrics. It was moved by Dr. C. E. Lyght, seconded by Dr. G. Snow, that the association express appreciation to Dr. Pryor for her work of the past years for the American Student Health Association.

Dr. Canuteson announced the appointment of two new committee chairmen: Dr. M. L. Durfee, who will succeed Dr. H. D. Lees as chairman of the tuberculosis committee; and Dr. Irvin W. Sander, who will succeed Dr. G. T. Blydenburgh as chairman of the committee on health service and physical activities.

Dr. B. D. Roberts was appointed chairman of a new committee on public relations to bring in recommendations as to suitable activities for the American Student Health Association in this field.

It was decided to accept Dr. Ruth Boynton's invitation to hold the next annual meeting in Minneapolis on May 8-9, 1946. A resolution was adopted thanking her for her generous hospitality to the council in 1945.

The luncheon meeting at 12:15 p.m. was devoted to a discussion of "Trends in the Health Service Program" led by Dr. H. S. Diehl. He pointed out the need to educate administration and faculty as to what constitutes an adequate student health service.

At the afternoon session, 2:00 p.m., Major H. E. Bank, medical officer, U. S. Veterans Facility, talked on "Health Problems of Returning Veterans." Methods of cooperation between student health services and veterans facilities in providing certain types of medical care were discussed.

At 6:00 p.m., Dr. Ruth Boynton entertained the council at supper at her home where an evening of fellowship was greatly enjoyed.

FINANCIAL REPORT

March 14, 1944, to May 29, 1945

RECEIPTS

Balance brought forward	
March 14, 1944	\$ 2,785.00
Dues collected 1945 (incomplete):	
for 1945—157 schools	1,570.00
for 1944—26 schools	260.00
for Proceedings	77.04
Total Receipts	\$ 4,692.04

DISBURSEMENTS

Secretary's Office:	
Postage	\$ 28.50
Telephone and telegraph	14.37
Stationery	52.64
Express	65.95
Secretarial help	145.00
	\$ 306.46

Publishing Proceedings, 450 copies	\$ 795.34
Subscriptions to JOURNAL-LANCET:	
1944—193 at \$1.50	289.50
1945—196 at \$2.00	392.00
American Council on Education, 1945	10.00

Council Meeting Expenses:	
Hotel Nicollet	\$ 75.20
President	47.73
Secretary-Treasurer	145.50

Section Refunds for 1944:	
Pacific Coast	\$ 12.50
Rocky Mountain	20.00
Southwestern	12.50
South Central	32.50

North Central	35.00
Illinois (no treasurer)	
Michigan	12.50
Indiana	15.00
Ohio	40.00
Mid-Atlantic (no treasurer)	
Southern	27.50
New York	45.00
Pennsylvania-New Jersey	42.50
New England	52.50
Mississippi Valley	10.00
Total Refunds	\$ 357.50
Total Disbursements	\$2,409.23

COMMITTEE REPORTS

Report of Committee on Health Instruction

Your Committee on Health Instruction met in New York October 1, 2 and 3, 1944. We spent the time conferring with Miss Marjorie L. Craig of the Metropolitan Life Insurance company relative to the publication of a list of source materials for teachers of college hygiene. In accordance with previous arrangements, which were reported at the Cincinnati meeting last year, the Metropolitan Life Insurance company agreed to finance the publication of this booklet.

The time was spent organizing the proposed booklet and selecting the reference material which should be included therein. The objectives of the course were decided to be as follows:

"There is a need of a bibliography to give young men and women a ready reference to some of the outstanding scientific publications upon various phases of healthful human living and service. Those interested in health instruction may find here some of the best available materials to make such instruction vital and interesting."

"The interest in health today gives an opportunity to direct young people to reputable source material and general reading covering problems of personal, community, social, mental, and occupational health."

"If the coming generation is to solve effectively the many vital problems which relate to healthful and vital living in the years that lie ahead, they must have access to the best scientific knowledge this present civilization can give them. In order that the effective use of these available materials may carry over into later life, regular habit of such a procedure is to be desired. The future health of a people depends upon the source material that motivates and activates their social, civic, world and personal living."

The committee decided that there should be definite divisions covering school health, non-communicable diseases, aviation medicine, rehabilitation, tropical medicine, vocational education, industrial hygiene or occupational diseases, and medical economics.

After the committee had completed this work, we decided to circularize the members of the association for suggestions and criticisms.

These have all been organized and the book is now in the process of publication and should be ready for distribution for the beginning of the next school year.

The committee is also working, in the preliminary stage, upon the problem of exemption examinations from beginning courses in health instruction. In the opinion of the committee there is such a varied difference in the past training and ability of college students that there needs to be some means of classifying them so that the college courses on informational hygiene would be of the greatest value to the furtherance of their health training.

Dr. De Kruif has been much interested in this for the past several years and has been making some rather wide experiments in the field. We hope to continue this activity.

A. O. DEWESE, M.D., Chairman

MARY DE KRUIF, M.D.

B. D. ROBERTS, M.D.

JEANNETTE EVANS, M.D.

J. D. FARRIS, M.D.

Report of Committee on Health Service and Physical Activities

We have no detailed report to make at present. However, the committee members are undertaking the following studies: Dr. Lee W. Milford is making a study of the medical methods of measuring physical fitness, with the idea of finding some simple way of determining physical fitness of a student during his physical examination or at other times. I think in this study, he will also survey the methods being used by the departments of physical education with some comments upon those methods. Dr. Florence Mahoney and Dr. Margaret Bell are making a study of the effects of the war period on the student health services of the country.

I have asked Dr. Denison of Western Reserve to make further studies with the view in mind of presenting a paper on the problem of the veteran back in college. Dr. Denison was chairman of a group discussion at the annual meeting of the Ohio Student Health Association.

G. T. BLYDENBURGH, M.D., Chairman
 GEORGE F. PARKER, M.D.
 MARGARET BELL, M.D.
 LEE W. MILFORD, M.D.
 W. R. GREENWOOD, M.D.
 F. N. MARTY, M.D.

Report of Committee on Organization and Administration

All of us have administrative problems, many of them peculiar to individual institutions, others of more general significance to our whole organization. At the present time there is a problem with which most of our member institutions will soon be faced, if they are not already. That is furnishing health service care to veterans of World War II. Veterans are, and will be in increasing numbers, entering college under the provisions of Public Law 346 (G. I. Bill) and Public Law 16 (Rehabilitation).

At first glance it might seem that veteran-students would be entitled to, and therefore would receive the same health service benefits as any other regularly enrolled student. However, on closer inspection of the facts we find several reasons that would lead us to believe that veterans will present us with several problems not encountered in the care of the usual civilian student.

INCREASE IN MEDICAL CARE PER CAPITA

First let us consider the matter from the standpoint of medical care alone. Veterans returning for college work before the end of the war will be largely those who have been discharged for medical reasons. They will therefore require more than average medical attention. Their disabilities will probably also handicap them in the college environment. To illustrate what is meant, the following types of cases have been reported.

Psychoneuroses: Psychoneurotic causes for rejection and discharge have been much in the limelight. All of us recognize these as not being entirely foreign to health service practice. But the relative numbers of these cases in proportion to the total number of veteran-students will undoubtedly be much higher than would be the case in an equal number of civilian students. Plans for the care of veterans must include provision for the availability of professionally trained personnel in the field of mental hygiene.

Tuberculosis: At least one health director has been confronted with the problem of caring for arrested, ambulatory cases of tuberculosis. This poses at least two serious threats. If many such veterans return to our campuses there will be a rise in the reported incidence of tuberculosis in colleges. There might be just cause for conflict of opinion between health service authorities and physicians of the Veterans Administration as to whether these cases were actually ready for return to a community as free from tuberculosis as we have reason to believe our member institutions to be.

Another matter regarding these cases of tuberculosis has to do with furnishing pneumothorax. If a student (civilian) were declared fit to enter college in spite of his need for continued pneumothorax it would seem that the health service should feel obliged to furnish this service. If veterans are declared eligible for college training under these circumstances, it may be neces-

sary to require their attendance at a college where this service is available.

Miscellaneous: Among the other disabilities that we may find among veterans in proportions somewhat greater than would occur in an equal number of non-veteran students, the following have been reported: asthma, peptic ulcer, malaria, neuro-muscular abnormalities and diseases of the skeletal system. These offer no special problem except from the standpoint of probable increased per-capita expense to the health service. There will also be increased responsibility placed on the health service with regard to the necessary recommendations for extra-curricular activity and excuse from required physical education, as may be indicated.

PAYMENT FOR CARE OF VETERANS

The second major administrative problem that health service care of veterans will bring to us is that of financing this care. For the most part our usual civilian student has had the cost of his total college program underwritten by the parent. For the amount of college fees collected, and earmarked for health service care, our different health services have varied greatly in the amount of service given. Very few student health services are on record as providing complete medical care for all illnesses.

Law 346—The G. I. Bill: Veterans will enter college under one or the other of two provisions made by the government. (There is a third law which has to do with benefits for merchant seamen. No information is available to us concerning this.) The first of these, the so-called G. I. Bill of Rights, stipulates that an eligible veteran will receive an allowance of funds from which he will be expected to pay his way. This, of course, will include payment for extra medical care over and above that furnished as a regular part of the college health service program. However, for "service connected" disabilities the veteran is entitled to free care from the *Veterans Administration*. The health service must receive authorization from the *Veterans Administration* before payment will be allowed for care of such service connected disability. It would seem that some general policy must be predetermined as to what constitutes a service connected disability.

Law 16—Rehabilitation of the Disabled: Veterans may also enter college under Law 16 which has to do with rehabilitation of the disabled. These veterans are entitled to free care, from the *Veterans Administration*, for any illness or abnormality which interferes with their training. When some such disability occurs for which free care is not given under the usual health service provisions the fact must be reported to the *Veterans Administration*, probably to the "facility" nearest the respective college community. In this manner authorization may be obtained at rates determined by the *Veterans Administration*.

RECOMMENDATIONS

The committee on organization and administration is of the opinion that difficulties may arise unless there is some definite understanding between the *Veterans Administration* and our student health services. If the unscrambling of red tape is left until after the fact of an acute emergency arising in a veteran-student there is the possibility that this student may suffer unnecessarily, or that the financial structure of the health service might be embarrassed. In view of the anticipated problems that may arise in the health service care of increasingly large numbers of veteran-students, the following recommendations are made:

That the executive council of the American Student Health Association appoint a committee composed of nationally known and accepted authorities on student health service practice.

That this committee be composed of sufficient personnel that the total will bring together all the varying geographical, social and economic areas in the United States, as these may affect the health service care of veterans.

That this committee be charged with investigating, by dealing directly with the *Veterans Administration*, problems that will arise in the health service care of veterans, for example:

1. Methods for obtaining service medical records that might be pertinent to the care of a veteran.

2. Definition of "service connected disability."
3. Devising some structure of liaison with the Veterans Administration so that each health service will know exactly where to appeal for help in the care of acute emergencies, how these contacts are to be made, and what proof of authorization is necessary in order to insure payment for services over and above that furnished as a regular part of the veteran-student's health service program.

MAX L. DURFEE, M.D., Chairman
 RUTH E. FAIRBANK, M.D.
 MILDRED E. SCOTT, M.D.
 WILLIAM G. DONALD, M.D.
 H. B. POTTER, M.D.

Report of Committee on Mental Hygiene

There have been no joint activities of the committee. Prior to cancellation of the annual meeting, I had written to each member with tentative suggestions as to a program based upon the changing mental hygiene load of our health services; how it was being met, and plans for greater adequacy. This was with the increasing "veteran" population in mind.

Individually several of us, I know, have already done considerable work in review of this subject. Dr. Frye has been connected with research of the National Council relative to service connected with mental illnesses. Dr. Small has been dealing with Manhattan Red Cross social service and selective service problems as well as those of one of the few complete psychiatric rehabilitation clinics. I have reviewed our experience with army students and veterans as compared to that of previous civilian populations. Individually, there have been published works and undoubtedly there will be more.

R. G. HINCKLEY, M.D., Chairman
 ROBERT FLEMING, M.D.
 CLEMENTS C. FRY, M.D.
 S. M. SMALL, M.D.
 CARL I. WYLER, M.D.

Report of the Tuberculosis Committee for the School Year 1943-44

In spite of continued unfavorable conditions in the college health field during the year 1943-44, programs for the control of tuberculosis have been maintained in a very encouraging manner.

Replies to our annual questionnaire were received from 400 institutions. The year previous the number was 399.

Case-finding programs were reported by 282 colleges, an increase of 15 over last year.

Tuberculin testing programs were reported by 199 institutions as compared with 208 a year ago. The Mantoux intradermal method is employed by 125 schools and the Vollmer patch test is in use at 54 schools.

There were 636 new student cases of tuberculosis diagnosed during the year. Of this number, only 14 were accounted for by 114 colleges which provide no routine case-finding program. Eighty cases of tuberculosis were discovered among food handlers, faculty members and other non-student personnel. Student withdrawals from college to undergo treatment for tuberculosis numbered 169. And again worthy of emphasis, we believe, is the large number of students returning to college following a previous diagnosis of tuberculosis—319.

Of special interest, we believe, is the significant increase in the number of students found to have tuberculosis in 1943-44 as compared with the previous year. The enrollment at 267 colleges having programs in 1942-43 was 406,626, while the 282 colleges with programs this year had a total of 286,018 students. This represents a decrease of 120,608 students in attendance at those colleges sponsoring case-finding programs. In 1942-43 there were 522 new cases of tuberculosis reported, a rate of 128.3 cases per 100,000 students. This year, 622 new cases of tuberculosis were diagnosed, a rate of 213.9 per 100,000.

It would seem that this increase probably reflects improvement in the quality and effectiveness of case-finding procedures at many of our colleges. Reports from quite a number of institutions indicate very definite progress in developing more adequate programs of tuberculosis case-finding.

A word of explanation should probably be added with ref-

erence to omission of the committee's annual report from its accustomed place in the April issue of the JOURNAL-LANCET. The statistical department of the National Tuberculosis Association was unable to get the material compiled and into my hands until early in April, whereas March first is the deadline for receiving manuscripts for April publication by the JOURNAL-LANCET.

H. D. LEES, M.D., Chairman
 PAUL B. CORNELY, M.D.
 Advisory Committee:
 J. BURNS AMBERSON, M.D.
 EDMOND R. LONG, M.D.
 J. A. MYERS, M.D.
 HENRY C. SWEANY, M.D.
 CHAS. E. LYGH, M.D.

Report of the Committee on Eye Health

In 1936 Dr. Annette Phelan of the National Society for the Prevention of Blindness came to me and presented evidence showing that the American Student Health Association was neglecting a major health problem, namely, vision conservation of college students.

At the following annual meeting of the association we appointed an eye health committee and secured the active services and cooperation of three eminent ophthalmologists as consultants in our committee: Dr. Benedict, Mayo Clinic; Dr. Gradle, Chicago; and Dr. Hardy, New York City.

This committee had many meetings in which we discussed all problems of vision conservation and presented numerous reports and recommendations to the association, and these were published in our association transactions and in several medical journals. The committee studied the psychology of vision, engineering problems of lighting, education, treatment of vision breakdown, and other pertinent details. New methods of vision examination were stressed, a new illuminated chart holder was devised and was used by a considerable number of institutions. A teacher training program was instituted in this field and scholarship aid for these courses was secured through the National Society for the Prevention of Blindness. Illumination of study surfaces was improved in many colleges and universities.

Since the beginning of the war, because of reduced health service personnel the committee has made very little progress. However, it seems to me that at the present time there is a strategic opportunity to revive this program, chiefly because we have available now the improvements in this field that have been the result of the experience of the armed forces.

Their contributions should be studied and applied where appropriate to our college populations.

Numerous recommendations have come to me recently which seem to be valid and should be carefully considered in improving our association program of vision conservation for college students.

R. W. BRADSHAW, M.D., Chairman
 J. H. KLER, M.D.
 DAN G. STINE, M.D.
 KATE ZERFOSS, M.D.
 A. B. DENISON, M.D.

Report of the Committee on Ear Health

There will be things to report as a result of studies in Army and Navy especially in submarine, air forces and artillery services. Some preliminary reports were made in Chicago. Dr. Fowler, who spoke at our New York meeting, was there, back from the Pacific area. One of the practical things to stimulate interest was a new movie made at University of Iowa, made primarily for parent-teacher groups and clubs and lay audiences to stimulate interest in the problem of hearing and emphasize steps to be taken. It shows that something can and should be done for those with hearing defects. I do not know how available that is for loan. It is well done and in color.

I think we all miss the meeting. It has been good for us and the work to get together. I know it has always done me a lot of good. We will look forward to the next opportunity.

J. W. ARMSTRONG, M.D., Chairman
 GRACE HILLER, M.D.
 J. D. SCHONWALD, M.D.
 J. W. McCLEERY, M.D.

Health Service Objectives

(*Presidential Address before American Student Health Association Council, May, 1945*)

Ralph I. Canuteson, M.D.

Lawrence, Kansas

MORE than three years have passed since we gathered in a normal annual meeting. Our meeting a year ago in Cincinnati was held during a period when we could only review past and current problems. We could not with any degree of certainty foresee the problems that now confront us. As this is written, we expect momentarily the termination of the first phase of the present war; military training programs in colleges are depreciating or closing; increasing numbers of veterans are returning to college campuses; and a new variety of responsibilities is accumulating on the existing depleted health service staffs. I shall not attempt more than an outline of matters needing our attention.

Without benefit of an accurate survey, we cannot appraise definitely the present status of health services nor their changed aspects as a result of war conditions. This is a worthy study for our committee on administration. From personal correspondence, we know that numerous health services in smaller and medium sized schools have been compelled to reduce activities to a minimum. Larger schools, and those directly connected with medical schools, have suffered less, although most of them are operating with skeleton staffs.

Here, then, is our first and most urgent objective. We must direct every possible effort toward replenishing our health service staffs with trained, interested personnel as soon as these men and women become available. Only an extreme optimist can foresee the fulfillment of this need until the war is definitely near an end. The few trained persons who have returned to civilian status up to the present time are confronted with such alluring opportunities for public service and personal advancement in other fields that health services cannot expect to compete until the number of such trained personnel is considerably increased.

As we face this conclusion, we also must turn attention toward setting standards of excellence in all phases of health service work, agreeable working conditions and opportunities for advancement that will to some extent compete with other forms of practice. Salary schedules in most health services are eligible for renovation. Too many staff members are so overloaded with routine daily tasks that they have neither opportunity nor energy left for study of the cases they see or for research problems. Opportunities for advanced training in the specialty of health service work are limited. Plans have been discussed in previous meetings to increase these opportunities but little has been done.

It is time we reviewed critically our accomplishments, with emphasis on quality rather than quantity of service rendered, on staffing with only the highest type of personnel, and on providing for them reasonable salaries,

opportunities for keeping abreast of their fields, and advancement as they become worthy.

The second big problem before us, I believe, is the direction of every effort to eliminate opportunities for criticism of college health services such as has been leveled at education, the medical and dental professions and other groups, when the high rate of selective service rejections became known. Blame for this situation has been passed about indiscriminately and the data are being used by various groups to further personal interests. No single agency or condition is at fault. A calm study of the data released so far leads to these conclusions: there is a wide difference between selective service standards and physical demands in the two world wars; remarkable progress has been made in certain fields, for example, in tuberculosis control; a large percentage of the physical disabilities could not have been avoided or corrected in our present state of knowledge and in a democratic nation; and the correctible defects are the responsibilities of combined action by various groups, rather than the concerted efforts of any one agency.

Fundamentally there are three major causes of the high incidence of disqualifying physical defects: heredity, over which we have little control; inadequate living conditions and nutrition; and failure or lack of opportunity to use prophylactic and therapeutic medical care.

A smoke screen generated by the ardent proponents of "health through physical education" has obscured the real issue. Not more than 2 per cent of the disqualifying physical defects of selective service registrants could have been corrected by carefully graded programs of physical education. Included in the cases that might have been corrected by proper physical exercise are: some cases of subnormal muscular development, posture cases resulting from poorly developed muscles, some cases of weak feet, and cases of overweight resulting from combination of excess diet and little activity. Aside from this, physical exercise has as its main objectives the development of muscular coordination, special skills and physical endurance, and recreational interests, none of which are causes for rejection of selectees. That physical education is not responsible for uniformly good results in physical development is plainly seen by the large numbers of young men rendered physically unfit for military duty as a result of injuries, particularly to the extremities, incurred in strenuous sports. Rosters of present-day college and professional athletic teams bear witness to this fact.

Our concepts of physical fitness have changed radically in the past four years. The term physical fitness has been loosely adapted to cover not only good health but also motor ability and physical endurance. Col. L. R. Rowntree has stated that "physical fitness is the bodily

state which combines maximum power and efficiency with the minimum time for recovery after exhaustion," and that the attributes essential to success in war and combat are strength, endurance, special agilities, leadership, initiative, emotional stability, and indomitable "will to win."

Peacetime living does not produce wartime "physical fitness." I do not believe we should plan to maintain all young men in the fine state of physical training that will permit them to step into the strenuous activities of combat over night. Every individual should be physically fit for the job to which he aspires. It is unreasonable to presume that it is sound from a health or economic viewpoint to attempt to achieve and maintain a combat level of physical fitness in all young people of selective service age.

Our objectives should be the production and maintenance of an optimum state of structural and functional health, correction of all remediable physical defects, education in the fundamentals of healthful living, and a schedule of graded physical exercises and recreational activities that will have carry-over value and that will fill the needs of civilian pursuits, and serve as a base line for more strenuous training if such becomes necessary.

The part the health service must play in this scheme is first a coordination with other departments concerned with health instruction and physical education, and second, added emphasis on careful, periodic, physical examinations, analysis of the physical defects found, and advice or active participation in the correction of remediable defects. Unless medical ethics and economics change materially in the next few years, there is no reason why health services that are equipped to do so may not take an active part in the correction of remediable defects when the student's financial status or available medical facilities in his home community do not permit him to obtain needed help.

Emphasis needs to be placed on special health factors—factors that may not be immediate causes of disability but which will impair physical efficiency if neglected. In this group are included renewed attention to tuberculosis control among students, faculty and other associated groups; more careful hearing examinations and search or causes of failing hearing; more use of careful eye examinations including refractions when indicated, and elimination of eye health hazards; dental examinations and opportunities for early care of defective teeth; analysis of the cases of organic heart disease and outlining programs that will offer the student prospects of a normal, useful life; study of the early cases of hypertension and kidney disease; development of practical function tests that can readily be incorporated in the routine examinations; and wider use of data accumulated in the day's work for the study of health problems. It

seems almost certain that in health service work we must see almost daily the precursory signs and symptoms of later degenerative diseases, but without prolonged follow-up we cannot recognize these signals.

In developing the strictly medical aspects of our work, we must not overlook the importance of health education. Statewide studies have been undertaken to determine the needs for health education and how to fill them. Kansas is in the process of such a study now under the direction of Prof. C. E. Turner. An ambitious program is under way to correlate the activities of groups interested in health education. Dr. Boynton will represent us at a meeting for this purpose to be held in New York late in May.

In the schools having the department of physical education and the health service separate, there is a great need for closer cooperation. Physical education, to be successful, must be adapted to the physical capacity of the student, which requires periodic physical examinations of all students engaged in physical exercise. In return the health service can expect help where corrective physical exercises are needed for special students.

A third problem of no little importance is the health of veterans returning to college. At the present time, practically all of these men are disabled for active duty. In other words, almost 100 per cent have physical or emotional problems of importance, whereas the usual run of students presenting such problems is less than 25 per cent. Many of these veterans have chronic illnesses; still more have emotional problems. It is doubtful if many of them have had time to adjust to civilian ways of living before coming back to school, from which most of them have been separated for periods of from one to eight or ten years. This entire subject is one requiring discussion at this meeting; undoubtedly the matter can be adjusted in most schools so that the veteran will receive every attention without its imposing an undue burden on the younger students who contribute equally to the support of health services. In any event, although the problem may be a major one in the next few months, it will be temporary.

I have mentioned rather sketchily what seem to me to be the problems needing our immediate attention. Many more might be listed, for, since the organization in 1906 of the first real health services as we recognize them, our departments have been given more and more responsibility for the health of college students. In the twenty-five years since the organization of our association we have made steady progress. War conditions have caused interruptions of some of our activities, but they also have emphasized the need for renewed efforts and leadership by our association in the field of student health.

College Health Service to Civilians and Military Students*

Melbourne Murphy, M.S.P.H.

Warren Forsythe, M.D.

Ann Arbor, Michigan

PERSONAL health service to students has been the predominant feature of the University of Michigan's student health program. This service was extended, on a contract basis, to members of the Army, Navy, and Marine Corps stationed on the campus. Service to these groups was basically as for civilian students, with such additions as were required by contracts; but the strictly routine services such as examinations, immunizations, and official record-keeping were not included.

The accompanying table and discussions compare experience with civilian and service students for the year July, 1943, to July, 1944. The Navy and Marine Corps groups were seen at sick call by a naval medical officer and those needing further attention were referred to the Student Health Service. Army sick call was attended by health service physicians for the most part. An army medical officer and small staff were present to handle routine services and to care for duties not under contract.

The civilian population was relatively stable for the entire year. The armed service personnel was figured on the average total strength per month since various groups left school at odd times as their training periods ended. No attempt has been made to separate age groups in the comparison, but it is known that the naval personnel had a lower average than that of the army group.

All clinical data except for numbers attending sick call were obtained from health service records.

Population figures showing total individuals enrolled for all terms indicate the aggregate net enrollment for civilians and service groups. The average civilian enrollment for each of the four-month fall and spring terms was 1754 for men and 3728 for women. The average for service groups was the same for student years. To make rates comparable and applicable to typical social situation, student years were determined theoretically in terms of twelve months continuous residence per student. For the Army and Navy there was considerable change in persons and for the separate terms many of the same individual civilians were recounted in the usual enrollment figures.

The figures for clinic calls include each visit by the patient to the various units and clinics in the building. In the Army and Navy figures the number of clinic calls includes the figures for sick call plus referrals to the various departments.

The figures for new patients in the civilian group refer to the individual persons who came to the clinic one or more times; 75 per cent of those enrolled during the year. For the Army the figures include all individuals

*Read before Council of the American Student Health Association, May, 1945.

who attended sick call during the year; 67 per cent of those enrolled. For the Navy the figures represent the individual patients who attended the clinic on referral from sick call; 44 per cent of those enrolled during the year. No data are available for the individual patients attending navy sick call.

A room call means that a physician went either to the patient's room or to the health service after regular clinic hours (8 to 5 except Saturday, 8 to 12, and Sunday, 11 to 12), to see a non-hospitalized case. The lower rate for the Army may be attributed to the fact that sick call rules are rigid and are followed. The Navy rate was higher probably due to the fact that the Navy physical education program lasted later into the afternoon with the result that many injuries were treated after closing hours and were recorded as room calls.

Hospital bed patients were those sent to the University hospital for care other than that available at the health service infirmary. The rate was higher for the service groups than for civilians, owing chiefly to the higher fracture rate among the former and the higher rate for contagions.

Infirmary patients were given bed care at the health service and again the rate was higher for the service groups. A higher incidence of upper respiratory infections among the military people partly accounted for this. Another reason is that the military authorities required their patients to be hospitalized if not fit for duty.

Physical therapy rates were again a great deal higher in the case of the military group. A more strenuous athletic program and a higher age level for the Army probably account in part for the increase.

Visits to the allergy clinic show a higher rate for civilians. A large proportion of these visits were for hay fever treatments. The lower rate for the naval group indicates selective screening on entrance physical examinations.

X-ray examinations show a higher rate for the Army than for the Navy or civilians. The higher age level with more chronic illnesses and requests for assurance probably accounts for this.

Mental hygiene interviews are very much less for the service groups. The medical officers did not promote this service. The figures for civilians do not include interviews with returning veteran prospective students.

Service men were given preference in the limited dental service available.

The average civilian net cost includes estimates of total expense to the university. It covers the very generous service provided with deductions of service earnings for

A Year's Experience with Civilian and Service Groups — General Items — July 1943 to July 1944

	Civilian Men	Civilian Women	Total	Army	Navy	Approx. Civilian Men	Rates/1000 Civilian Women	Student Army	Years Total	Student Army	Years Navy
Population—Total Individuals Enrolled (all terms)	3,520	5,920	9,440	4,073	2,430						
Population—Student Years	2,051	2,707	4,758	1,145	1,460						
Clinic Calls			73,906	23,969	24,294				15,532	20,933	16,639
Sick Calls only				16,945	*14,761						
New Patients			7,073	2,746	1,070						
Calls to student rooms			954	162	400		200	141	274		
Infirmary Patients	534	746	1,280	426	633	260	275	372	433		
Other Hospital Bed Patients	43	61	104	39	56	21	22	34	38		
Physical Therapy Treatments			3,297	4,563	2,810		693	3,985	1,925		
Visits to Allergy Clinic			17,536	1,421	155		3,685	1,241	106		
X-ray Exams at Health Service			\$2,115	868	606		444	758	415		
Mental Hygiene Interviews			4,052	202	158		852	176	108		
Students Interviewed in Mental Hygiene Unit	336	548	884	80	57	164	202	185	70	39	
Dental Clinic Visits			3,541	2,055	1,644		744	1,795	1,126		
Dental Clinic Patients			1,550	417	356						
Refractions			906	160	144		190	140	99		
Deaths, Total	1		1	0	0		.2	0	0		
Costs per Month			\$2.61	\$3.42	\$3.36						
Appendicitis, acute	31	34	65	13	26	15	12	14	11	18	
Contagious (all)	24	59	83	28	53	12	22	17	24	36	
Fractures	28	41	69	41	67	14	15	14	36	46	
Infectious Mononucleosis	30	47	77	20	30	15	17	16	17	20	
Otolary Operations at H. S.	39	36	75	11	6	19	13	16	10	4	
Pneumonia	43	32	75	50	76	21	12	16	44	52	

* Held by naval medical officer at quarters.

† Does not include entrance physical examinations.

some essentially elective services. Upon this base, gross costs of other contractual services for military personnel are added and total about \$50 over the amount received from the Army and Navy.

The very significant increase in pneumonia for the service groups occurred during the fall months and has no certain explanation. The weather was cold and the daily out-of-doors program did appear to result in ex-

cessive body chilling. The increase in fractures may be explained by differences in the required exercise program.

SUMMARY

A year's experience at the University of Michigan Health Service shows that more medical care was required for military students than for civilians. This greater requirement was probably the result of closer supervision, required hospitalization, rougher exercise, closer quarters, and more exposure.

X-RAY WAS DISCOVERED 50 YEARS AGO

The roentgenologist is the magician of modern medicine. He is the modern Aladdin, the genie of whose magic bottle is the mysterious x-ray. Truly he looks into the crystal and predicts the future. By his wizardry we may look at the beating heart, the stone in the kidney, the ulcer crater, and the distorted physiology of malignancy.

The radiologist will show you, in stereoscopic projection, the mysteries of tuberculosis: the cavity, the infiltration of infection, the healed and calcified battleground. He will point out the amount of necrosis in bone or the extent of the reparative process. He will demonstrate to the surgeon the results of his adjustments of fractures and will predict what the future should bring. One of the most dramatic phases of all surgery is to us the setting of a fracture under the fluoroscope.

Within his darkened cave this modern Merlin conjures up more wonders than all the ancient necromancers. He will make visible the passage of opaque fluid through the entire gastrointestinal tract and indicate any variance

from the normal. He will locate with surprising accuracy hidden foreign bodies and will treat, with the magic of his ray, skin lesions and deep-lying malignant processes.

How many things of supreme importance in our daily medical lives we take for granted. Scarcely ever do we stop and look back over the shoulder to see how far we have come along the highway of progress. It is wise, now and again, to give thought to the things we of this Age of Wonders accept as commonplace. Two things of today are to us of absorbing interest: the perpetual miracle of a radio, the mystery of the x-ray.

Let us pause to pay tribute to this tireless group of scientists, the roentgenologists, who stand beside the physician and surgeon and give all-out assistance in the problems of disease. These men work at great personal risk, but you will never hear one of them admit it. They are the real magicians of modern medicine; they deal in scientific sorcery.—BERNARD McDougall, M.D.*

*Published originally as an editorial in the Detroit Medical News, May 12, 1941, and reprinted, as issued by the American College of Radiology, in commemoration of the 50th anniversary of the discovery of x-ray.

Hypofunction of the Lacrimal Gland and the Sjögren Syndrome*

Andrew de Roeth, M.D.
Spokane, Washington

NORMAL function of the lacrimal gland is necessary to keep the surface of the cornea and conjunctiva moist and lubricated and to assure the cleaning of the conjunctival sac through the more or less steady flow of tears toward the tear sac and nasal cavity. The chemical composition and osmotic pressure of tears probably play a rôle in the metabolism of the cornea.

It is difficult to determine the normal function of the lacrimal gland, for, as in most bodily functions, the normal varies widely. Schirmer¹ estimated the output of tears from one half to two thirds of a gram a day when the lacrimal gland is not subjected to stimulation. He devised a simple method to determine the quantitative function of the gland. At one end of a strip of blotting paper 35 mm. long and 5 mm. wide a piece 5 mm. long is bent, the corners of this piece are cut off, and the bent piece is hooked over the margin of the lower lid and allowed to remain there for five minutes. If the whole strip becomes moist within five minutes, this time is marked. If not, the portion that became wet is measured. The first 5 mm., the part of the strip that lies on the conjunctiva, is disregarded.

This method is not perfect, because it does not measure directly the function of the lacrimal gland but is based on the sensitivity and irritability of the cornea and conjunctiva to the blotting paper and the response of the lacrimal gland to this irritation. Besides, blotting papers have different textures, surfaces, and absorptive capacity. I² have tested a dozen different blotting and filter papers. Whatman No. 41 filter paper, "double acid washed, very rapid, soft with open texture," proved to be the best among the papers tried. It is not hard, has a very fine velvety surface that adheres well to the tarsal conjunctiva, and has good absorptive capacity. I proposed that strips made of this paper be used in making the lacrimation test, thus introducing one constant factor and making possible the comparison of results obtained by different investigators.

Apart from the congestion of the conjunctiva caused by weeping, the eye does not suffer from the overproduction of tears. I was able to collect $\frac{1}{2}$ cc. of tear fluid from one eye in two to three minutes through reflex stimulation of the lacrimal gland by smelling ammonia. How low can the lacrimal production be before the eye suffers? According to Schirmer, everyone who has a lacrimation of less than 15 mm. in five minutes may be suspected of a paresis of the excitolacrimal fibers, and the lacrimal gland and its innervation can be considered normal if the moisture amounts to more than 15 mm. in five minutes. However, this standard does not seem to be entirely correct. I examined 162 persons of all age

groups, mostly refraction cases, who had no trouble that could have originated from the hypofunction of the lacrimal gland. The production of tears decreases with age, at least up to the sixth decade. Twenty-seven out of 78—that is, one third of the individuals older than forty years—had a lacrimation of 15 mm. or less, which is considered pathological by Schirmer. In my experience a production of 4 mm. or less of tear fluid by the Schirmer method is usually accompanied by at least subjective symptoms. When the production is between 4 and 10 mm., trouble may or may not be present. It is exceptional to find symptoms of lacrimal deficiency when more than 10 mm. are produced.

There are three grades of severity of corneal and conjunctival changes due to hypofunction of the lacrimal gland. However, it must be stressed that the severity of the clinical picture does not exactly parallel the rate of tear production.

The most marked clinical picture has been known for many years as filamentary keratitis. This rare condition is a textbook disease which requires little discussion. It is characterized by epithelial filaments, half a millimeter to several millimeters long, on the cornea, with a knob at the free end. This painful condition occurs not only with hypofunction of the lacrimal gland, but also in dendritic keratitis and corneal abrasion, and, very rarely, after cataract operation.

The second clinical picture due to diminished lacrimal secretion is called keratoconjunctivitis sicca, and has been treated in the American literature in the papers of Beetham,³ Bruce,⁴ Gifford, Puntenney and Bellows.⁵ The objective ocular symptoms are light to moderate congestion of the bulbar conjunctiva and a stringy,ropy mucoid discharge. In marked cases the lid conjunctiva is red and swollen, even velvety. There are tiny round gray dots in the corneal epithelium and punctiform staining with rose bengale or fluorescein, more marked in the lower half of the cornea. The subjective ocular symptoms are moderate photophobia; burning, grittiness, and difficulty in reading, especially by electric light. Decreased vision may occur when the small epithelial defects or infiltrations are in the pupillary area. There is a moderate hypesthesia of the cornea. Only seldom does the patient complain of dryness and difficulty in opening the eye in the morning. The Schirmer test shows 0-3-6 mm. in five minutes.

Sjögren⁶ considered these eye manifestations as one of a syndrome. Associated symptoms of this Sjögren syndrome are dryness of the mouth, nose, and larynx, due to decreased function of the salivary glands. Such patients cannot eat toast or other dry food. About 50 per cent have chronic arthritis (Bruce), mostly of the chronic infectious type, but also of the endocrine (Umber) type.

*Read before the Montana Academy of Oto-Ophthalmology, July 8, 1945.

In a few cases, hypochromic and also pernicious anemia was observed and an increased sedimentation rate was found. Dental caries is marked, but the majority of patients have artificial dentures. In a few patients subfebrile temperature was reported. The most tormenting symptoms are the pricking and burning of the eye, and, when present, the disabling chronic arthritis.

The mildest form of the lacrimal hypofunction, which I² described in 1941, is characterized by fatigue or heaviness of the eye and difficulty in reading, especially by artificial light. Some patients say their eyes do not open freely in the morning and prick when first opened. Only rarely is there dryness of the eyes. A dry, warm, dusty season aggravates the condition. There is little or no dry secretion in the inner angle. Since keratitis is not present, this condition cannot be classed with keratitis sicca. Only occasionally are there a few tiny dots staining with fluorescein or a fine epithelial edema. The bulbar conjunctiva may be slightly congested or normal, as is the cornea. When the lid is pulled from the eyeball, it adheres just a bit more than in a normal eye. The Schirmer test is 2-10 mm.; in one case it was 15 mm. The accompanying symptoms are moderately dry mouth (though the mouth is usually normal), dental caries or loss of most of the teeth, and a slight chronic arthritis in the joints of the fingers. The same associated symptoms are found in the Sjögren syndrome, in which they are more marked.

The frequency of the three clinical forms is shown in the following figures. Of 6200 eye patients I had three cases of filamentary keratitis, seven cases of keratitis sicca, and twenty-one cases of mild hypofunction, with a frequency for all grades of lacrimal hypofunction of one in 200. In filamentary keratitis the Schirmer test was 0-3, in keratitis sicca 2-8, in the mild form, 2-15.

PATHOGENESIS

The principal factor in the pathogenesis of all three forms is diminished lacrimal secretion. This decrease may be brought about by congenital absence of the gland, surgical removal of the gland, destruction of the gland by radiation, the presence of toxins, and by some less clearly defined causes connected with endocrine dysfunction.

Surgical removal occurs in case of tumor of the lacrimal gland or of the temporal portion of the lid and conjunctiva, when severing the ducts of the lacrimal gland is unavoidable. The following case will illustrate. Mrs. M. L., aged 56, had a basal cell carcinoma involving the temporal canthus and the temporal fourth of the upper and lower lids of the left eye. About a third of both lids had to be removed before plastic repair. The cosmetic result was good, but the eye was irritated and sandy and had aropy secretion and numerous small epithelial defects of the cornea. There was no tear production whatever, because the ducts of the gland were severed when the tumor was excised. The condition was improved by closure of the lacrimal puncta. Partial removal of the lacrimal gland, an operation formerly used to relieve the epiphora following extirpation of the tear sac, is known to have caused keratitis sicca in a few instances.

Destruction of the lacrimal gland by radiation was observed in the case of a woman, aged 72, who suffered x-ray burns when she had x-ray treatment of the face to remove excessive hair growth. When I saw her, half a year after the treatment, the skin of the temporal third of both the left upper and lower lids and of the region of the outer canthus and temporal region was atrophic, with marked telangiectasia. The temporal half of the bulbar conjunctiva was in the same condition. The eye was dry, burning, and painful, and affected with filamentary keratitis. The Schirmer test was 1 mm. The other eye was normal.

Probably toxins can damage the lacrimal gland. One must suppose this to be true in Bruce's case of a boy, aged 17, who had sore eyes following a severe attack of scarlet fever. The corneas stained irregularly and superficially, the conjunctivas were congested, and the Schirmer test was 0.

In most cases the cause of lacrimal hypofunction is not so clear. In what I should call the senile-endocrine type, with an added, unknown, perhaps toxic factor, the great majority of patients are women. Of 31 such patients coming to me, only two were elderly men. The women are usually in the postclimacteric age. If they are younger, there is some pathology of the ovaries, e. g., cystic ovaries, oophoritis, or radiation therapy, or one or both ovaries have been removed. I had three such cases. Several of the elderly women too had had a disease or surgery of the ovaries several years before the onset of eye manifestation. Several authors, e. g., Fried and Goldzieher,⁷ have lately mentioned this endocrine factor in connection with keratoconjunctivitis sicca. Hollos, in his unpublished experiments, got dry corneas after extirpation of the lacrimal gland in rabbits, but only when the ovaries were also removed.

However, advanced age and absence of ovarian function seem to be only a predisposing factor. There must be a further factor, which may be toxic. Sjögren maintains that the disintegration of the parenchymal cells of the lacrimal and salivary glands, the chronic arthritis, and the high sedimentation rate point to a chronic infection, but he admits that this infection may be of secondary importance to the decreased function of the ovaries.

PATHOLOGY

In keratoconjunctivitis sicca the early pathological changes are hypdropic degeneration of the epithelium and swelling and granular disintegration of the elastic fibers. Later, groups of mononuclear cells, mostly lymphocytes, are found. However, the important primary change takes place in the lacrimal gland in the form of an "adenopathy leading to atrophy," as Sjögren terms it. It is a primary noninflammatory disorganization of the tubules, an atrophy of the protoplasm of the parenchymal cells, leaving the nucleus of the cell intact. Secondary occurrences are round cell infiltration and the proliferation of connective tissue, which always occurs in parenchymatous organs when the parenchyma is gone. Sjögren found similar changes in other salivary glands. In filamentary keratitis the pathological changes are the same. In the mild form of hypofunction no pathological

examination has yet been done, but there is reason to believe that such an examination would reveal the earliest stage of the same process, i. e., atrophy of the parenchymal cells of the lacrimal gland.

THERAPY

As long as the etiology of this disease is unknown, the most effective way to combat the eye manifestations is to provide for lubrication by local application substituting for the lacrimal fluid. Solutions for this purpose have been suggested by various authors. They include solutions of NaCl, 1 per cent; NaCl, 1 per cent and Na-HCO₃, 1/3 per cent; sodium salicylate, 2 per cent; asparagine, 1 per cent with boric acid 1 per cent; liquid petrolatum; egg albumin; fibrolysin; lysozyme. The latest and probably best solution is Gifford's formula: gelatin, 0.3; chlorobutanol, 0.3; Locke's solution, 30.00.

However, none of these fluids corresponds to the physiological tear fluid. The best method is to conserve the small amount of tears produced in affected eyes by occlusion of the puncta, as advocated by Beetham in 1935. I agree with all authors who have employed it that this is by far the best procedure. The heat or diathermic destruction of the epithelial lining of all four canaliculi has to be complete to get an immediate and dramatic result.

Other therapeutic experiments conducted with the purpose of acting on the lacrimal gland through systemic application of physostigmine, pilocarpine, acetylcholine, liver, iron, arsenic, and further fever therapy, and also the intended stimulation of the lacrimal gland by roentgen rays, were of no avail. So also was the administration of vitamins, especially vitamin A, used because of a certain resemblance among keratomalacia, xerophthalmia due to vitamin A deficiency, and keratitis sicca.

The ideal treatment would be one counteracting the endocrine disturbance and the toxic factor. For this purpose the prolonged use of ovarian extract is advisable. With this therapy several of my patients have subjectively improved, although the Schirmer test has not re-

vealed an increased tear production. I have never tried testosterone in the few male patients I saw with keratitis sicca.

To eliminate the toxic factor, it is advisable to remove infected foci, though there is usually no indication of such foci. In a severe case of keratoconjunctivitis sicca I gave the patient penicillin and theelin at the same time. The patient was entirely relieved of the grittiness of the eyes, and they did not feel dry, though the Schirmer test did not reveal increased tear production.

SUMMARY

My purpose is to call attention to the diseases due to hypofunction of the lacrimal gland, especially to the scarcely known mildest form. Keratitis filamentosa and keratoconjunctivitis sicca are not common but are fairly easy to recognize from the patient's complaint, the eye symptoms, and other associated symptoms, e. g., dryness of the nose, mouth, larynx, chronic arthritis, and high sedimentation rate, usually among women in the post-climacteric age. The mild form is harder to recognize because of the vagueness of the patient's complaints and usually complete lack of objective symptoms, except for the positive Schirmer test. The cause of the disease is not entirely clear, but endocrine disturbances, probably decreased function of the ovary combined with a toxic factor, do play a rôle. Only in a few cases is the etiology clear cut, namely, when the lacrimal gland is removed or destroyed. The most effective therapy consists in occlusion of the puncta. In mild cases, administration of ovarian extract and the frequent use of sodium chloride and sodium hydrocarbonate drops or Gifford's solution are effective.

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The University of Minnesota Commended by the United States Army for the Work of the Twenty-sixth General Hospital

President James L. Morrill of the University of Minnesota is in receipt of a letter from General Joseph T. McNarney of the United States Army, commanding the service of the Twenty-sixth General Hospital. General McNarney's letter reads as follows.

HEADQUARTERS
MEDITERRANEAN THEATRE OF OPERATIONS
UNITED STATES ARMY
APO 512

October 16, 1945

Subject: Commendation
To: The President, University of Minnesota,
Minneapolis

With the inactivation of the Twenty-sixth General Hospital after long overseas service in this command, it is suitable to extend to the University of Minnesota and the Faculty of the Medical School, appreciation and commendation of the distinguished service of this affiliated unit.

The high standard of professional service maintained by the hospital has reflected great credit on the medical officers and nurses as individuals. This credit

may properly be shared by the University of Minnesota, their sponsor.

JOSEPH T. McNARNEY
General, USA Commanding

President Morrill's letter in reply reads as follows.

UNIVERSITY OF MINNESOTA
Minneapolis 14

OFFICE OF THE PRESIDENT

October 30, 1945

General Joseph T. McNarney, USA
Hdq. Mediterranean Theatre of Operations
APO 512, c/o Postmaster, New York, New York

Dear General McNarney:

The University of Minnesota appreciates the commendation of the United States Army, Headquarters Mediterranean Theatre of Operations, of the Twenty-sixth General Hospital.

It is gratifying for the University of Minnesota to know that the members of its staff contributed to this vital phase of the war, and it shares with those members in humble acknowledgment of the generous credit you confer.

Sincerely,

J. L. MORRILL, President

Diagnosis and Postsanatorium Care in Pulmonary Tuberculosis*

W. L. Meyer, M.D.[†]
Sanator, South Dakota

PERHAPS it is presumptuous for me to attempt to tell you, who have been in the practice of medicine longer than I, anything about a disease as common as tuberculosis. However, I have found that a review of a disease, even of one with which we are familiar, occasionally is of value and that is my excuse for being here. I would like to remind you briefly of two cases illustrating this point and then review the diagnosis and suggest some postsanatorium treatment.

In the first case, a woman came to the sanatorium after having had a cough for an extended period of time. She had consulted her physician because of this cough and had even suggested the possibility of an active tuberculosis. He ignored this possibility, probably because he was too familiar with the family history and was reluctant to consider that as a possible diagnosis. Having received no benefit from this doctor's treatment after several months, she consulted another physician and a diagnosis of tuberculosis was made at once. When she was admitted to the sanatorium her tuberculosis was very far advanced and it was difficult to give her any relief.

In the other case, a patient had consulted a reputable doctor for much the same complaint and had requested a sputum examination. This doctor, likewise, was reluctant to consider such a possibility and did not secure the sputum for examination. It was only after several months that she consulted another physician and a sputum sample was secured. This sputum sample did contain tubercle bacilli and the patient was admitted to the sanatorium.

It is my desire to refer patients back to their original family physicians after they are ready to leave the sanatorium, but it is very difficult, if not impossible, in such cases, because they have absolutely no confidence in them. Both of these cases are those of reputable men in the state of South Dakota.

I wish only to review very briefly the diagnosis of tuberculosis before passing on to postsanatorium treatment. In the diagnosis of tuberculosis the Mantoux test is very reliable. At the present time the P.P.D. test is used perhaps more than any other. This consists of the injection of P.P.D. material in the first strength. The test is read forty-eight hours later. If the original test is negative, it must be followed up with a second strength P.P.D. If this strength is likewise negative in forty-eight hours, the test is considered negative. A negative test means that the patient has not had a tuberculosis or, as may happen in very rare instances, the patient may have

healed a tuberculosis by calcification so that all tubercle bacilli are killed, or the patient may have a very far advanced, very active disease, in which case the test occasionally can be negative. A positive test merely means that at some time in the past the patient has had an active tuberculosis. It will not indicate whether the disease is active nor in what part of the body it is located. The patch test is gaining popularity at this time and is considered almost as reliable as the double strength P.P.D.

A clinical history is essential in a diagnosis of pulmonary tuberculosis—a procedure I am sure is familiar to all of you. I wish, however, to remind you that only one or two of these symptoms may be present, and that a patient can have an active disease that is practically asymptomatic. Our old classic symptoms of pulmonary tuberculosis consist of afternoon fever, loss of weight, loss of strength, night sweats, cough, hemoptysis and dyspnea, usually with an increased pulse rate. Any or all of these symptoms, either alone or in combination with others, suggest a very careful examination for tuberculosis; particularly any cough which persists for a month demands an x-ray of the chest.

Physical examination will vary greatly, depending on the location and extent of the lesion. Perhaps the most important point that I should make, with regard to physical examination, is that a negative examination of the chest is of no value, just as a negative sputum sample is of no value. Only positive findings can be relied upon. It is possible to have extensive disease with no physical findings. If any case presents a history that is at all suggestive of tuberculosis, it is not possible to rule this out without either a Mantoux or an x-ray.

For x-ray examination the 14"x 17" stereo plate is the one to be desired. The 14"x 17" single plate is fairly reliable; however, not as accurate as the 14"x 17" stereo. The miniature film, be it 35 mm., 70 mm., or the 4"x 5" plate, is used mainly for mass survey work and is not of great value as far as the diagnosis of the single case of tuberculosis is concerned.

Laboratory Examination—Sputum Examination. The direct smear is comparatively unreliable, unless the organisms are found. In case the organisms are not found, concentrate examination of the sputum should be made. This is much more reliable than the direct smear. The culture is likewise more reliable than concentrate examination and of course the guinea pig inoculation is of still more value. I must remind you that a single negative sputum is not reliable. It is likewise possible that a patient with a far advanced tuberculosis, even with

*Read before the Yankton District Medical Meeting, September 20, 1945.

[†]Sup't. South Dakota State Sanatorium, Sanator, South Dakota.

cavity formation, may have a consistently negative sputum. The blood count is not a reliable diagnostic aid. It is quite possible for patients to have a far advanced tuberculosis with an essentially normal blood count, particularly insofar as the red and hemoglobin are concerned. There is usually an increased white count with some disturbance in the differential. Usually the monocyte count is increased. However, this likewise may be the case in other conditions, so it is impossible to use it as a differential diagnostic base. Sedimentation rate is usually increased and may run as high as 140 or 150.

Lack of time necessarily limits extended discussion of differential diagnosis. I wish only briefly to mention some of the most common conditions to be considered. On differential, atypical pneumonias must be considered. It is rather difficult to rule this out, particularly in the case of an active tuberculosis with a negative sputum. However, an atypical pneumonia is more likely to be located in the lower portion of the lung field. Most forms of atypical pneumonia that persist for an extended period of time, particularly those lasting several months, are very difficult to diagnose from a tuberculosis with a negative sputum. A bronchiectasis is usually located in the lower portion of the lung field near the mediastinum and can be eliminated by lipiodol injections. Tumors and cysts in the lungs I wish to classify in one group. Of course the metastatic malignant tumors, particularly if they are multiple, are usually rather easy to diagnose from a tuberculosis. The occasional gelatinous tuberculous infiltrate, if a solitary nodule in the parenchyma of the lung, may resemble closely a solitary metastatic nodule. Usually, however, the original malignant area may be detected in some other portion of the body. A bronchogenic type of malignancy usually differs quite markedly on the x-ray from a tuberculous infiltration. Non-malignant tumors are usually solitary and present a homogenous appearance which is quite easily differentiated from a tuberculosis. Boeck's Sarcoid presents an appearance somewhat resembling tuberculosis and is usually in the mid-portion of the lung field. Sputum is negative and the Mantoux is likewise negative. A bronchitis usually presents no radiographic findings except for slightly increased markings and is usually in the lower portion of the lung field. Cardiac involvement shows a marked increase in the transverse diameter of the heart. The condition is usually in the lower portion of the lung field and usually bilaterally symmetrical. The fungus infections are comparatively rare in this part of the country, but must be given consideration. The fungus usually is found easily on sputum examination. The various types of pneumonocrosis rarely are seen in this part of the country. However, they must be given consideration and are frequently seen in mining communities.

Postsanatorium Treatment. It is our desire to keep all patients at the sanatorium until they have been on at least two hours' walking exercise for a period of two months. Their sputum must be consistently negative and the x-ray must show regression of the lesions. The patient must be afebrile. The type of treatment they re-

ceive at home will depend entirely on the type of treatment they have received at the sanatorium. The patient who has not received any collapse therapy must receive the following treatment at home. Rest hours, usually two hours in the morning and two hours in the afternoon: this rule must be observed strictly and the hours must be the same hours each day. It is very important to have the patient retire at the same time each night, preferably about nine or nine-thirty. If this rule is broken, with the patient staying up until midnight some nights, it is impossible to regain what has been lost, even though the patient were to stay in bed the entire next day. With the patient on only two hours' walking exercise, no work is to be attempted. With the average patient it is usually possible to increase the walking exercise about ten minutes a week. Sputum and x-ray examinations should be secured at three-month intervals. When a patient with pneumothorax is discharged from the sanatorium the above treatment will be supplemented by pneumothorax refills at periodic intervals. The length of time between refills and the amount of air at each refill will depend entirely on the individual patient. This will vary depending on the rate at which he absorbs the air and to a certain extent on his activity. Some patients require refills with only a few cubic centimeters at monthly intervals, whereas other patients will require refills up to as high as 600 cc. every week. This can be determined only by close observation of the patient and fluoroscopic examination or x-rays at frequent intervals. A patient with a phrenic, thoracoplasty, or a paraffin pack requires the same postsanatorium treatment as the patient without any collapse therapy. A patient with an extrapleural pneumothorax requires the same care as the patient with an intrapleural pneumothorax.

I wish to discuss very briefly our proposed plan for mass survey work in the state of South Dakota. A contract has been let for the purchase of a 70 mm. portable x-ray to be used for the survey of everyone in the state. An x-ray technician and two clerks will be sent with this unit. Any resident of the state is eligible to have an x-ray taken by this unit. There will be no charge. The x-ray film will be returned to the sanatorium for interpretation and, if there is evidence of pathology, a report will be forwarded to the local physician. This report will indicate merely that the patient has some type of chest disease and a complete check-up should be had. The patient likewise will be notified that he should report to his local physician for an examination. We feel that at the time of this examination by the local physician a 14"x 17" plate is mandatory, along with a complete physical examination. The local physician is requested to report back to the State Board of Health the findings of the clinical examination and is requested to forward the 14"x 17" plate to the sanatorium for interpretation.

It is probable that this unit will be delivered about the first of the year. It will be financed by funds that have been allocated by the federal government for the control of tuberculosis. Funds will be placed in the hands of the State Board of Health for use in this state.

The Prevention of Crystallization and Stone Formation During Constant Urinary Drainage*

Major Howard I. Suby, M.C., A.U.S.

CONSTANT urinary drainage is frequently required for long periods of time in the care of war wounds of the urinary tract and spinal cord. Whether this is accomplished by means of an inlying urethral catheter or a suprapubic tube, a principal problem is the partial or complete blockage of the catheter or rubber tubing due to crystallization of the urine. The obstructing sediment is caused by urinary infection with urea-splitting organisms and concomitant alkalinization of the urine. Unless the crystals are mechanically or chemically removed, complete or partial obstruction with leakage of urine around the catheter occurs. Not infrequently, bladder calculi develop.

Frequent changing of catheter and tubing and irrigating the drainage system with the ordinary solutions (saline, boric, and potassium permanganate, etc.) have not proved satisfactory in managing this problem. Frequent changing of catheter is troublesome and painful and sometimes is dangerous or contraindicated, as in injuries of the urethra. Moreover, the ordinary irrigating solutions are relatively ineffective in preventing crystallization.

The use of solution G, an irrigating fluid developed to dissolve urinary calculi,¹ has proved so satisfactory in preventing crystallization of the urine during constant urinary drainage that it seems desirable to call attention to its use for this purpose. This solution is a solvent for calcium phosphate and calcium carbonate and yet is relatively nonirritating to the urinary tract. The formula is:

FORMULA FOR SOLUTION G

Citric Acid (monohydrate)	32.25 G.
Magnesium Oxide (anhydrite)	3.84 G.
Sodium Carbonate (anhydrous)	4.37 G.
Water, q.s. ad	1000 cc.

The most practical method of using solution G will naturally depend upon the case and the type of drainage employed. In patients with "cord bladders" on tidal drainage, solution G should be used alternately with sterile water, boric acid solution, or saline. The percentage of total time on solution G should be determined by the amount of crystallization and urinary infection. In patients with relatively clear urine, one eighth of the total time on solution G may be sufficient to keep the drainage system free of encrustations. In severely infected cases, on the other hand, it may be necessary that solution G be used as the irrigating fluid for 50 per cent or more of the total time.

In dealing with a patient on constant drainage with either a urethral, suprapubic, or perineal tube, the problem is different. The efficacy of this therapy is dependent on getting and keeping the solution in contact with the encrustations. Consequently it is necessary to instill slowly 2 to 4 ounces of the solution into the bladder and keep it there for two minutes, then allow it to drain out. This procedure should be repeated at least three times, twice daily. In severe cases it may have to be done as often as every four hours. A simple effective closed drainage system is illustrated in Fig. 1. This closed sterile system prevents the possibility of contamination at the time of irrigation. If solution G is used as the only irrigating fluid, this type of system can usually be kept clean indefinitely.

SUMMARY

Attention is directed to the efficacy of Solution G in preventing crystallization and calculus formation during constant urinary drainage. This solution is a solvent of calcium phosphate and calcium carbonate, yet is relatively nonirritating to the urinary tract.

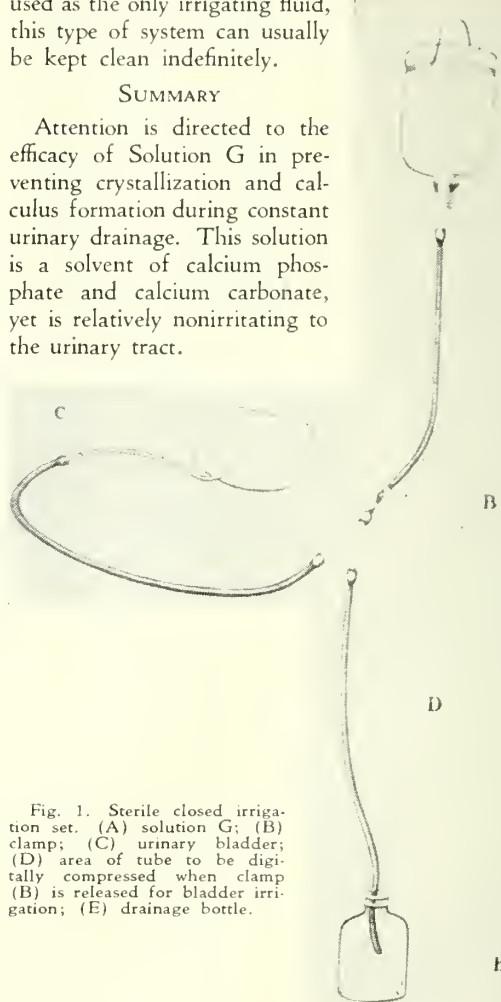


Fig. 1. Sterile closed irrigation set. (A) solution G; (B) clamp; (C) urinary bladder; (D) area of tube to be digitally compressed when clamp (B) is released for bladder irrigation; (E) drainage bottle.

*From the Surgical Service of the 5th General Hospital.

¹Suby, H. I., Albright, F.: New England J. Med. 228:81, 1943.

The Obligations of an Internist to a General Surgeon

Under the title "The Medical Correlator" Dr. A. E. Hedback contributed the lead editorial in the October 1945 issue of JOURNAL-LANCET. (It well might have been entitled "The General Practitioner Speaks to the Specialist.") In the October 1944 issue of SURGERY, Dr. Thomas Findley had something of the same kind to say in somewhat more humorous vein about the obligations of an internist to a general surgeon. We are pleased to reprint it herewith.

An internist has been defined as a man who is totally unable to answer either yes or no to any question. The definition was made in jest but there is much truth in it. If there is such a thing as a typical internist, he is a sedentary individual, curious, skeptical, reflective. He is accustomed to look at the patient as a unit rather than as a collection of separate organs and, if he has had the fundamental scientific training he should have had, he is eager to distinguish between a fact and someone's opinion. Although often powerless to suggest an alternative procedure, he regards every operation as an exercise in violent therapeutics and a confession of failure to cure. He is, however, humble before the complexities of modern surgical technique. His fees are not such as to command general admiration.

The surgeon, on the other hand, is a man of action. He lives in an exhilarating world of knives, blood, and groans. His tempo is of necessity rapid. He is inclined to look at his less kinetic colleague with an air of puzzled condescension but may, in a relaxed moment, admit that the medical man is occasionally able to assist uncomfortable dowagers in the selection of a cathartic. Accustomed to legerdemain and quick results, he is apt to regard the diagnosis and treatment of a headache, for example, as a trivial matter, forgetting that the internist may require hours of probing before discovering that what the patient needs is not a new pair of glasses but a different mother-in-law. The surgeon and the internist are workers in the same vineyard, but their points of view are inevitably different.

Of those patients who come to any clinic for help there is a certain small percentage who present definite and well-demarcated problems—a broken arm, a decompensated heart, a gravid uterus, for example. Of these the internist will claim his share and do what he can. Over and above these, however, is a larger number with ill-defined complaints who tax the resources of the entire staff. These are the ones who are commonly x-rayed from head to toe, whose fluids and excrements are examined with great skill, into whose every orifice electric lights are inserted—to no avail! The standard reaction on the part of the medical attendant then is that of anger. The patient is automatically regarded as an imposter who has no right to his symptoms and his visit to the clinic is looked upon as a nuisance and an intru-

sion. Actually, of course, these are perhaps the sickest people we see. It may be argued that they are merely suffering from such elemental emotions as grief, frustration, inadequacy, fear, or sorrow, that their problems are therefore non-medical, and that the clinic is not required to help them. If this is so, we are amateur physicians indeed.

W. R. Houston has frequently and eloquently pointed out that sickness of any sort carries with it a curious and sometimes irresistible demand for action. There is nothing to which a sick man will not submit himself—he is gladly purged, puked, bled, transfused, sweated, infused, cut, frozen, heated, and shocked and he will swallow literally anything. It is seldom that the consequences of these actions are considered, for it is action itself that is demanded. Even the most normal of us howl and gyrate when thrust suddenly into pain; these actions serve no useful purpose whatever, but somehow they seem to bring relief.

And so these people come to us in their distress demanding both action and relief. This demand comes not only from the patient but from the family as well. One can never enter a sickroom without being immediately aware of immense forces at work. The urge to violence is often so compelling that it requires great courage to follow the wiser course and do nothing. Certainly it is a commonplace experience for patients to complain that we have found nothing for which to operate upon them, and it is no consolation to these people to be told that their roentgenograms and blood tests are negative. It is another curious fact that no one minds being told that he has something wrong with one or more of his organs, but he bitterly resents the implication that the trouble lies within himself. A heart that is failing a little, a sluggish liver, a pair of weak lungs—these are cherished and respected ailments—but a personality defect is accepted with the greatest reluctance.

In dealing, as it must, with individuals whose primary difficulty is emotional, a clinic finds itself in a peculiarly dangerous situation because a certain percentage of these patients will inevitably present some physical abnormality which, in a more stable host, would be a legitimate surgical target. The diagnosis of anxiety state, chronic reactive depression, or conversion hysteria is not made by exclusion, however, and it would be a major error to assume that an elderly housewife could not have a psychogenic backache and a fibroid tumor as well. The surgeon often accuses the internist of complacency and ignorance when he chooses to ignore a uterus which is not quite perpendicular, or a solitary gallstone, or a pair of tonsils from which a fluid of unknown composition can be expressed. There are certain people, however, who demand violence; the surgeon enjoys removing organs and one function of the internist is to see that these two never meet.—(THOMAS FINDLEY, M.D., New Orleans, La., from October, 1944 issue of *Surgery*.)

Book Reviews

The Examination of Reflexes, by ROBERT WARTENBERG, M.D. Chicago: The Year Book Publishers, Inc., 222 pages, illustrations, 1945, \$2.50.

The author recalls that Dorland lists nearly 250 reflexes. Between the years 1918 and 1935 seventy-six new pathologic reflexes were described. Considerable confusion obtains because authors are credited variably by writers and the name of a particular reflex is determined irregularly from the site of its elicitation, the muscles involved, the ensuing movement, the joint on which it acts, the nerves involved, etc. Furthermore, responses due to decreased innervation, the associated movements, and reflexes of spinal automatism, the so-called defense and postural reflexes, are not always clearly distinguished from what is essentially the true meaning of striated muscle reflex: a contraction stimulated preeminently by a brief concussion and stretching. The chief focus of attention should be on the muscle where action is provoked and not on the point of elicitation of the reflex. Classification on such "points" as tendon, bone, periosteum, joint, fascia, or aponeurosis is only misleading. Every muscle crosses one or more joints and in the waking state is comparable to a tautly drawn bowstring. Reflex contraction is obtained not only from either side of the bowstring but also from neighboring and even distant points, with the bone acting as transmitter of the mechanical stimulus. Multiple, even completely independent, reflexes may be elicited by one stimulus. The terms "paradoxical" and "antagonistic" reflexes are unjustified, because the phenomena thus labeled are merely occasional forms of well-known deep reflexes appearing under certain conditions and depending on particular techniques applied in their elicitation. Whereas every muscle has its deep reflex, only a few have their superficial or skin evoked reflex as well.

Illustrations include seven figures. Figure 7 dramatically illustrates that in our literature the one plantar muscle reflex, indicated by plantar flexion of the toes when seven different areas of the foot are stimulated mechanically, has been given the name of twenty different writers between the years 1893 and 1933!

Hayfever Plants—their appearance, distribution, time of flowering and their role in hayfever, with special reference to North America. By ROGER P. WODEHOUSE, Ph.D. (associate director of research, Lederle Laboratories). Waltham, Mass.: Chronica Botanica Co., 245 pages, 73 illustrations, new and numerous tables. Series of Plant Science Books, vol. 15 1945. Price \$4.75.

This book, according to the author, "is intended to interpret the botanical facts of hayfever in terms of their clinical significance." It is an authoritative botany of hay fever by the author of *Pollen Grains*, universally known by allergists. Contents: The Botany of Hay Fever; The Hayfever Plants—Gymnosperms, Angiosperms, Monocotyledons, Dicotyledons; Regional Surveys; Glossary; Bibliography.

The first three chapters are devoted to pollens and pollination and the role that pollen plays in hay fever, as well as a description of all the plants known to cause hay fever, showing where they grow, when they flower and the characteristics which make them hay-fever plants. The last, or fourth chapter, is geographical, dealing with regional surveys with accurate and recent data on ten areas throughout the United States. Numerous illustrations of plants and their pollen grains, mostly drawn by the author, are very informative and bring out details frequently lost by photography. For convenience of presentation, there is a map in which the United States is divided arbitrarily into ten sections. The pollinating periods of hayfever plants in these regions represent accurate, recent surveys, with the most important plants clinically printed in heavy type. A choice is given to English names of current usage in the hayfever literature, and where there is a secondary choice it is added as a synonym. The print throughout makes it very easy reading

and the arrangement is excellent for ready reference. The references to local surveys of others are very complete, and there is a discussion on hay-fever resorts. There is a valuable glossary.

The book is indispensable to all physicians interested in allergy when managing their local hay-fever problems, and it is the most complete reliable text on the subject today.

Allergists will welcome this authoritative book on the flora, responsible for clinical hay fever and asthma, indigenous to their respective areas, when treating their pollen-sensitive patients.

Technical Methods for the Technician, by ANSON LEE BROWN, M.D., Columbus, O.: Third Edition; published by the author. 712 pages with laboratory index and general index, glossary, listing of 100 texts, illustrations and 12 color plates: 1944, price, \$10.

The director of a clinical laboratory and school for technicians, the author has endeavored to present a compendium of methods and procedures that will aid and save time for laboratory technicians. Since well equipped and properly staffed laboratories are now recognized as a necessity for the application of good medicine and with physicians in increasingly short supply, this book is especially timely and should be of help.

The emphasis is on technique. The various procedures are interpreted, and the interpretations are worth while as the result of technique evaluation and the author having indicated the diseases in which the tests have pathologic significance. A brief outline will indicate the comprehensiveness of the volume: Laboratory Behavior; The Microscope; Urinalysis (56 pages); Blood (75 pages), Examinations, Blood Chemistry—covering in this section blood counts and the counting chamber; Serology (in which the author's test for syphilis is presented for the first time together with full details of the Wassermann test, the standard Kahn, Kline, etc.); Agglutination Tests: Tests for typhoid, undulant fever, tularemia, dysentery, typhus; Tissue Sectioning and Staining. As a refresher and/or reminder the book appears to be all inclusive and should be of assistance to prospective and currently working technicians.

Fractures and Dislocations (for Practitioners) by EDWIN O. GECKELER, M.D. Baltimore: The Williams & Wilkins Co., 1944, 361 pages, \$4.50.

This is an excellent book. As the author states, it is probably of greatest interest to medical students, interns, and general practitioners who are not caring for many fractures. It also has points which may be of help even to men who specialize in orthopedics. The text is clear. The book has an unusually detailed table of contents, systematically arranged, and a general index. Through these reference may be quickly made to the subject which the reader desires most to see. The book contains numerous line drawings, reproductions of photographs and x-ray films wherever it is necessary to illustrate the condition under discussion. The text routinely takes up the etiology of the lesion, the manner of the examination, prognosis, treatment, follow-up, and precautions, and is entirely devoid of unnecessary words. The suggestions and directions for one of the standard methods of treatment of a given condition is to be found clearly and simply described and well illustrated. Certainly the author has accomplished his aim and the book can be freely recommended.

Radiologic Examination of the Small Intestine, by ROSS GOLDEN, M.D., professor of radiology, College of Physicians and Surgeons, Columbia University; director of the radiologic service, the Presbyterian Hospital, New York. Philadelphia: J. B. Lippincott Co., 240 pages with 183 illustrations of subjects in 75 figures, 1945, \$6.00.

This is a valuable contribution to a relatively neglected phase of roentgenology written by a well-known teacher and recognized authority in the field of radiology. It is profusely illustrated and includes the results of the author's personal investigations as well as the opinions of numerous other contributors to the subject. Of particular interest and importance at this time are the descriptions of lesions of the small intestines due to various nutritional disorders and to parasitic infestations.



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MINNEAPOLIS, MINNESOTA, DECEMBER, 1945

UNIVERSITY OF SOUTH DAKOTA MEDICAL SCHOOL ADOPTS FOUR-YEAR CURRICULUM

We note with pleasure that the University of South Dakota plans to extend its medical school curriculum from two to four years. The expansion was authorized by the 1945 legislature when the two-year school was threatened with loss of its accreditation.

The first junior students will be admitted in the spring of 1946, and the present sophomore class will be the first to continue training at the university. President I. D. Weeks states that the new curriculum will enable more South Dakotans to study medicine and predicts that it will encourage graduates to remain and practice in the state. The school will also provide refresher courses for practicing physicians and will serve as a health and medical service center.

Detailed plans for the junior and senior years are be-

ing arranged by Dr. T. C. Ohlmacher, dean of the medical school, and Dr. Edwin Shaw, professor of biochemistry, in cooperation with physicians in private practice. Dr. Ralph L. Ferguson, formerly senior pathologist at Edgewood Arsenal, Maryland, has joined the faculty as professor of pathology and will assist in the organization of the four-year course. Other faculty members will be added this winter.

The Sioux Valley and McKennan hospitals at Sioux Falls will be utilized for the junior year clinical work. The senior year will be organized on a preceptor basis, utilizing other hospitals in the state. The state hospitals at Yankton and Sanator will also cooperate in the program.

The JOURNAL-LANCET extends congratulations to the State of South Dakota and best wishes to the immediate participants in this forward-looking movement.

A.E.H.

PREVENT TB—BUY CHRISTMAS SEALS

The 50th anniversary of the x-ray finds tuberculosis associations throughout the nation, health departments, and the U. S. Public Health Service using the mass

x-raying of large groups of apparently healthy people as a first line of attack against tuberculosis, which still takes a life every nine minutes in the United States.


Tuberculosis associations and health departments now have more than three hundred mobile x-ray units — actually x-ray clinics on wheels — in operation. In the past six months the Hennepin County (Minnesota) Tuberculosis Association has made more than 9000 chest x-ray examinations as a Christmas seal supported public service. The U. S. Public Health Service, operating eight mobile x-ray units installed in special buses, in two years examined more than one million industrial workers and found more than 15,000 with infectious or noninfectious tuberculosis.

A mobile unit costs approximately \$18,000. It is estimated that there are about half a million cases of active tuberculosis in the United States, of which 200,000 are unknown. Every person in the United States could be examined within a year with some two thousand mobile x-ray units, according to Dr. Herman E. Hilleboe, chief of the Tuberculosis Control Division, U. S. Public Health Service. The cost of these units would be \$35 million, operating expense \$25 million—a total less than the cost of a battleship. Universal chest x-ray examinations are no dream but a definite goal of the official and voluntary health agencies.

In the meantime the annual sale of Christmas seals continues to maintain throughout the country such established tuberculosis control services as a year-round program of health education for children and adults, homes and rehabilitation for the care of former tuberculosis patients, to prevent relapses, and to provide clinics and nurses to seek for unknown cases.

The 39th annual sale of Christmas seals is now being conducted to provide funds to maintain an alert against any possibility of a postwar increase in incidence of this disease.

WHAT ARE WE WILLING TO PAY FOR HEALTH?

Writing under this title in a recent issue of *The New York Times Magazine*, Dr. Theodore G. Klumpp refers to the five bills relating to the promotion of science now before Congress as "signs that like Rip Van Winkle we are awakening to the importance of science to our national welfare." At the same time he thinks we fail to realize the overwhelming importance of providing for medical research as a part of our program to advance science.

"The extent of disease and disability is so great," Dr. Klumpp writes, "that medical research has without question the richest field in science for its exploration."

A thoroughgoing revision of our present conception of medical research is necessary if we are to devote to it

the effort and resources demanded. Dr. Klumpp suggests that medical research is far too important a problem to be left, as with a few notable exceptions it is at present, to the spare time of overburdened physicians, professors, and students in our medical schools. The full-time attention and devotion of thousands of research men are needed.

A country that devotes huge sums to agricultural research and advertising, the doctor affirms, while spending a comparative pittance on the problem of solving the most serious problem of civilized man—the deaths and disabilities from disease and premature old age—has a topsy-turvy set of values.

THE DOCTORS RETURN

The wheel has come full circle. As this final issue of the JOURNAL-LANCET's 75th year goes to press, the trials of Japanese and Nazi war criminals are in progress and medical journals and societies that four years ago were beginning to announce the departure of their subscribers and members for service are now kept busy announcing their return to practice. Dr. Irvine McQuarrie of the University of Minnesota heads a committee that has the responsibility of helping to place these returned men in civilian medical service.

In Montana Dr. Paul Eneboe has returned to Bozeman and will resume practice in the Eneboe-Sabo Clinic early in 1946, after special study in obstetrics and pediatrics in Chicago. Dr. Claude M. Mears, flight surgeon and captain with the Army Air Force for three years, has returned to practice with the Medical-Surgical Clinic, Helena. Lt. Col. D. N. Monserrate, who was port surgeon at Southampton, England, in charge of evacuation of medical cases from France to England, and then to the United States, has returned to Helena and will resume his medical and surgical practice in the spring of 1946, following graduate study in California. Major M. O. Anderson will resume practice in Hardin after nearly three years of overseas duty and service in eight major campaigns in Europe and North Africa.

In North Dakota, Dr. A. Veitch, a captain in the Army Medical Corps, has taken up practice at Lisbon.

Minnesota doctors returning to practice include Dr. Albert I. Balmer, Edgerton; Dr. D. M. Potek, International Falls; Dr. B. A. Flesche, Lake City; and Dr. Henry A. Korda, St. Cloud.

Minneapolis physicians resuming practice include: Dr. Charles A. Aling, Dr. Samuel G. Balkin, Dr. Harold G. Benjamin, Dr. James Blake, Dr. Max Broude, Dr. Carl G. Caspers, Dr. S. Alan Challman, Dr. Reuben F. Erickson, Dr. Reinhold M. Ericson, Dr. Edward T. Evans, Dr. Douglas P. Head, Dr. Willis L. Herbert, Dr. Emil W. Johnson, and Dr. Russell C. Lindgren.

Dr. D. R. Gillespie, formerly a Fellow at Mayo Foundation, Rochester, Minnesota, returned to St. Paul November 2 after spending 22 months in the southwest Pacific in New Guinea and the Philippines with the 247th General Hospital. He plans to resume practice early in 1946.

These are but a few of those resuming practice. The names of others will be found under *News Items*.

MEET OUR CONTRIBUTORS . . .

DR. RALPH I. CANUTESON, president, MELBOURNE MURPHY, and DR. WARREN ELLSWORTH FORSYTHE, past president, contribute the addresses made before the council meeting of the American Student Health Association in Minneapolis last May.

Dr. Canuteson, who contributed an editorial on college health service to our October issue, is head of the health service at the University of Kansas.

Mr. Murphy of the University of Michigan health service is also an instructor at the University School of Public Health. The direction of his leisure-time activities is indicated by a term as president of the Ann Arbor Civic Orchestra.

Dr. Forsythe, director of the University of Michigan health service, and well known for many years in his chosen field of medical service, is also professor of hygiene and public health at the university, which is his alma mater.

DR. ANDREW F. M. DE ROETTH of Spokane is a graduate of the University of Budapest (1919) and pursued graduate study there and at Tubingen (1919-23). Dr. de Roeth, whose specialty is ophthalmology, is a member of the A.M.A., the American Academy of Ophthalmology and Oto-Laryngology, and the International College of Surgeons. Formerly associate professor at the University of Budapest and Pécs and lecturer at Northwestern University Medical School, he has practiced at Spokane for the past six years.

DR. W. L. MEYER of Sanator, South Dakota, is a graduate of the state university of South Dakota and had his medical training at Creighton University (1930). He was president of the Black Hills District Medical Association in 1944 and is a member also of the South Dakota State Medical Association, the A.M.A., and the American College of Chest Physicians. Dr. Meyer, whose specialty is tuberculosis, has practiced at Sanator for six years.

DR. HOWARD I. SUBY of Boston, a medical officer with the U. S. Army (hospital unit) at the time he contributed the article published in this issue of JOURNAL-LANCET, is a graduate of Harvard Medical School (1934) who did graduate work at Boston City Hospital and Massachusetts General Hospital, where he was Dalton Research Fellow. His specialty is urology. He is a member of the New England Branch, American Urological Association, and the Massachusetts Medical Society. Dr. Suby has now resumed practice in Boston.

ANNOUNCEMENT OF VAN METER PRIZE AWARD

The American Association for the Study of Goiter again offers the Van Meter Prize Award of three hundred dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association which will be held in Chicago, Illinois, in April or May, 1946, provided essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy sent to the corresponding Secretary, Dr. T. C. Davison, 207 Doctors Building, Atlanta 3, Georgia, not later than February 20, 1946. The committee, which will review the manuscripts, is composed of men well qualified to judge the merits of the competing essays.

A place will be reserved on the program of the annual meeting for presentation of the prize award essay by the author, if it is possible for him to attend. The essay will be published in the annual proceedings of the association. This will not prevent its further publication, however, in any journal selected by the author.

News Items

Dr. Robert Anderson has returned to his native Livingston, Montana, to practice, after completing his internship and surgical residence at Colorado General Hospital, Denver.

Dr. R. W. Spicher has been warmly welcomed as physician and surgeon at Terry, Montana, where he has established a home with his wife and infant son. Prairie County has long needed a permanent medical man, according to the *Terry Tribune*. A native Montanan, Dr. Spicher is a graduate of Northwestern University Medical School.

Dr. Joseph F. Borg, St. Paul, was elected president of the American Therapeutic Association at its recent meeting in Cincinnati.

The Grand Forks District Medical Society met on October 17 at the Deaconess Hospital, with 67 present. Dr. Arlie R. Barnes of the Mayo Clinic spoke on "Cardiac Disorders Amenable to Surgical Treatment," Dr. C. D. Creevy, Minneapolis, on "Some Unusual Aspects of Renal Tumors," and Dr. George B. Eusterman, Mayo Clinic, on "Diseases of the Liver, Gallbladder and Biliary Tract." Dr. Barnes's paper appeared in the November JOURNAL-LANCET.

Dr. Reuben C. Johnson, Minneapolis, has been elected president of the Minnesota Society of Internal Medicine. Dr. Charles Watkins of the Mayo Clinic is the new vice president and Dr. Alex Brown, also of the Mayo Clinic, the secretary-treasurer.

Licenses to practice medicine in Montana have been granted to Doctors Eugene Hildenbrand, Great Falls; Leonard M. Benjamin, Butte; Harold E. Coulston, Powell, Wyoming; Clarence A. Bush, Beach, North Dakota; and Bernard L. Orbins, Glendive, Montana.

Dr. William F. Cogswell, Montana director of public health and executive officer of the Montana Board of Health for the past thirty-three years, has announced his retirement effective April 1, 1946. Dr. Cogswell, oldest state health officer in the United States in term of service, was the initiator of the Rocky Mountain laboratory of the U. S. Public Health Service in Hamilton, Montana. Dr. David T. Berg, Helena, will succeed Dr. Cogswell as executive officer of the state board of health.

Dr. Joseph Robert Truscott, physician and surgeon at Binford, North Dakota, for over twenty years, has left there and will study at a university in eastern Canada.

The Mount Powell Tri-County Medical Society met November 19 at Anaconda to hear an address by Dr. J. J. Malee on "Differentiation and Treatment of Various Types of Shock in the Army."

The examination of the American Board of Ophthalmology will be held June 22-25, 1946, in San Francisco. The change in time and place was made because of transportation difficulties.

Lt. Col. Harold T. Little, Duluth, has been appointed surgeon to the Army's Alaskan department.

Dr. J. Richards Aurelius, St. Paul, was appointed by the American College of Radiology as a member of the advisory committee for the nation-wide celebration of the fiftieth anniversary of the discovery of x-rays, held the week of November 5.

Dr. Ralph Vinje has returned to his former practice at Beulah, North Dakota, after over four and a half years of continuous active duty with the Army Medical Corps. Dr. Vinje spent 36 months overseas, took part in three Pacific theater campaigns, and was awarded the American Defense ribbon, Asiatic-Pacific theater ribbon with three campaign stars, Philippine Liberations ribbon with one campaign star, the Bronze Star for heroic achievement in combat, and the Combat Medical badge. He saw his son, 3-year-old Ralph Allen, for the first time in June of this year.

The November meeting of the Hennepin County Medical Society was devoted to reports by staff members of the U. S. Army General Hospital 26 on activities of their unit in North Africa and Italy. Dr. L. Haynes Fowler spoke on "Surgical Service," Dr. Russell C. Lindgren on "Medical Service," and Dr. Douglas P. Head on "The Peptic Ulcer Problem in the Army."

Dr. Kurt S. Tauber and Miss Margery C. Adams, daughter of the late Dr. G. S. Adams, were married at Yankton, South Dakota, September 15. Dr. Tauber, now an American citizen, had his medical training at the University of Vienna. He has been a member of the state hospital medical staff at Yankton since 1941.

Capt. Carson B. Murdy, Aberdeen, South Dakota, has returned from service overseas and will be associated with his father, Dr. Beecher C. Murdy, in the practice of medicine.

A full standard public health unit for the area has been asked by the Burleigh County, North Dakota, Farmers Union. The union's resolution pointed out that North Dakota, which is 70 per cent rural, has only 7 physicians, 10.4 nurses, and 2.5 dentists per 10,000 of population, and that 48.9 per cent of the state's inductees were rejected for military service.

Physicians resuming private practice after war service include Dr. T. L. Trelstad, Crosby, Minnesota, who will be associated with Dr. B. A. Smith; Dr. Paul Bjelland, Minneapolis; and Major Wallace E. Anderson, Thief River Falls, Minnesota.

The North Minnesota Medical Association held its annual session and 25th anniversary meeting November 3 at Fergus Falls. Dr. H. L. Parker, Rochester, spoke on wartime Ireland and consultant practice; Dr. W. T. Peyton, Minneapolis, on early herniation of the intervertebral disc; Dr. W. A. O'Brien, Minneapolis, on postgraduate medical education; Dr. Corrin Hodgson, Rochester, on common misinterpretations in medical diagnosis; Dr. William A. Stafne, Fargo, North Dakota, on the recognition of malignant lesions of the stomach; and Dr. Richard Lynn Varco, Minneapolis, on preoperative dietary preparation for surgical patients.

Governor Thye of Minnesota has appointed a committee to study hospital and health needs, with a view to raising standards and improving and integrating public health efforts. The first meeting was held November 9.

The North Dakota Society of Obstetrics and Gynecology, meeting at Minot, November 3, held the following program: Dr. Carl Baumgartner, Bismarck, spoke on "Transverse Presentations"; Dr. R. T. LaVake, University of Minnesota, on "Serology and Obstetrics"; Dr. Paul Breslich, Minot, on "Gynecologic Pathology"; Dr. G. Wilson Hunter, Fargo, on "Acute Lymphatic Leukemia"; and Dr. Duncan E. Reid, Harvard Medical School and Boston Lying-in Hospital, on "Problems of Protracted Labor."

Lt. Com. Harry B. Neel, Albert Lea, Minnesota, surgeon, has an article entitled "Anesthetic Agents in the Treatment of Battle Casualties," in the September *U. S. Naval Medical Bulletin*. Dr. Neel, at present stationed at Norman, Oklahoma, served on hospital ships for several months in the Pacific area.

Lt.(jg) Darrell E. Westover, Fergus Falls, Minnesota, of the Navy Medical Corps, has left for Pearl Harbor.

Dr. Wallace P. Ritchie, who served 33 months overseas with the 26th General Hospital in England, North Africa, and Italy, and was the first medical officer to receive a discharge under the point system, was the luncheon speaker at the fall board meeting of the Woman's Auxiliary, Minnesota State Medical Association, St. Paul, November 8.

Dr. L. S. Jordan, superintendent of the Riverside Tuberculosis Sanatorium, Granite Falls, is the new president of the Minnesota Public Health Association, succeeding Dr. F. E. Harrington. At the annual meeting of the association in October Dr. Harrington warned that all service men returning home should be x-rayed promptly to determine whether they have tuberculosis symptoms. Dr. J. A. Myers, chairman of the education committee, announced a new tuberculosis program for public schools, under which schools will receive certificates when 95 per cent of students, teachers, and employees have taken x-ray tests.

Dr. James Francis Hanna, Fargo, president of the North Dakota State Medical Society, addressed the Grand Forks District Medical Society at its meeting of November 21, 1945, on the subject "The North Dakota Medical Profession and the Postwar Period."

Slope County, North Dakota, held the second of a series of free clinics to protect children against smallpox, diphtheria, and whooping cough on October 30 and 31. The clinics are conducted by Dr. Mary Soules, district health officer.

Dr. F. R. Schemm, Great Falls, has returned from an extended trip east, during which he gave papers on the treatment of heart disease in Kansas City and Chicago and attended a meeting of the American Physicians' Council at Ann Arbor. He was accompanied by his wife, who is Mildred Walker, the novelist.

Dr. John Esser of Perham, Minnesota, has been appointed village physician and chairman of the board of health.

Necrology

Ethel Remington Beede, 64, Faribault, Minnesota, died at Cheyenne, Wyoming, October 13, after she was taken off a train when she suddenly became ill. Dr. Beede, a graduate of the University of Minnesota medical school, retired from the medical staff of the Minnesota State School and Colony in Faribault late in 1944, after more than twenty-six years of service, and since then had been vacationing in various parts of the country. She had planned to rejoin the school medical staff in November.

John LeRoy Burton, 41, Buhl, Minnesota, only physician of Buhl and head of the St. Louis county hospital there, was killed October 31 when his car went into a ditch as he was returning from a country call. Dr. Burton was a 1936 graduate of the University of Minnesota medical school.

Dr. Albert Carr, 90, died October 31 at Rapid City, South Dakota. A resident of the Black Hills for fifty years, he had practiced in Hill City until about five years ago. Funeral services for Dr. Carr, who left no known relatives, were conducted by the Masonic Lodge of Hill City.

Dr. Nathan Freeman Doleman, 68, physician at Tintah, Minnesota, for forty years, died November 8 in Kansas City, while en route to McAllen, Texas, with Mrs. Doleman to spend the winter.

Dr. Charles Floyd Jump, 63, died October 23 at Fort Harrison veterans' hospital, near Helena, Montana, after an illness of about ten days. Lt. Col. Jump, a native of Illinois, served with the Montana 163d infantry in World War I and as state medical officer for the Montana headquarters of selective service in World War II.

Dr. Edward Thomas Anderson, 76, died at the veterans' hospital, St. Cloud, Minnesota, November 1. Dr. Anderson, a veteran of World War I, practiced medicine in South Dakota for some years, and had lived in Excelsior, Minnesota, from 1923 to 1939.

Dr. Clarence Good Shearon, 46, Chicago, died November 17 of a heart attack. A native of Elk Point, South Dakota, Dr. Shearon was national medical director of Montgomery Ward & Company and a director of the Illinois Social Hygiene League.

Dr. Harold D. Palmer, 44, died of a heart attack while visiting the home of a patient at Bryn Mawr, Pennsylvania, November 20. Dr. Palmer, a native of Fairmont, Minnesota, and a graduate of the University of Minnesota Medical School, was professor of psychiatry at Women's Medical College, Philadelphia, and associate professor of psychiatry at the University of Pennsylvania. He contributed an article, "Mental Disorders of Old Age," to the special geriatrics issue of JOURNAL-LANCET in June 1944 and was expected to contribute to the new bimonthly journal, *Geriatrics*.

Classified Advertisements

INTERNIST AVAILABLE

Internist, thirty-seven, married, Diplomate, American Board Internal Medicine, veteran, just released from Army, excellent hospital appointments during entire Army career, excellent training, excellent references, desires association with group. Address Box 829, care of this office.

FOR SALE

Complete equipment and supplies of modern twelve-bed hospital. Surgical instruments practically new. Portable x-ray, electric sterilizers, beds, splints, OB table, linen of all kinds and many other items. Can be had at a great saving. Address Box 830, care of this office.

PHYSICIAN AND SURGEON WANTED

County seat town in western South Dakota. Well established, lucrative, unopposed general practice—prosperous farming and cattle area. Well equipped twelve-bed private hospital may be rented or purchased with office equipment. Excellent surgical instruments. Unusual opportunity. Address Box 831, care of this office.

PHYSICIAN WANTED

Physician wanted for general practice in small group. Salary or any arrangement agreeable with eventual partnership if congenial. Warren Clinic, Warren, Minnesota.

Advertisers' Announcements

2 NEW U. S. VITAMIN PRODUCTS FOR TREATMENT OF DEFICIENCIES

Hypervitam Multiple Vitamins

Lipo-Heplex B Liver Fractions

The U. S. Vitamin Corporation, makers of Vi-Syneral and other vitamin and mineral dietary supplements, have made available two new prescription preparations designed for the therapy of vitamin deficiencies, in conformity with the modern trend in nutrition which today emphasizes special products for the therapy of actual vitamin deficiencies.

Hypervitam is a multiple, high potency vitamin formula for the treatment of vitamin deficiency by oral administration. It is based on wide clinical experience which finds that symptoms of avitaminosis are almost always multiple in character and that intensive dosages of the lacking vitamins are required for satisfactory results.

For the treatment of sick, surgical, debilitated, and convalescent patients, a daily dose of three Hypervitam capsules provides: vitamin A, 30,000 U.S.P. units; thiamine (B₁), 30 mg.; riboflavin (B₂), 15 mg.; niacinamide, 150 mg.; pyridoxine, (B₆) 3 mg.; calcium pantothenate, 15 mg.; ascorbic acid (C), 300 mg.; vitamin D, 3,000 U.S.P. units; alpha tocopherol (E) 30 mg.

Since nutritional failure may be associated with almost any disease, the company points to the many indications for the prescribing of Hypervitam.

Lipo-Heplex for Oral Vitamin B Complex Therapy

Lipo-Heplex is said to be a more complete oral preparation for the treatment of vitamin B deficiencies. It may be expected to provide substantially greater and more rapid improvement than less complete formulas lacking one or more of the essential liver fractions. Lipo-Heplex combines three significant fractions of liver: aqueous, 80 per cent alcohol insoluble, and lipid with important crystalline B factors.

Each Lipo-Heplex capsule provides the vitamin extracts and concentrate (water-soluble, 80 per cent alcohol-insoluble, and lipid fractions) derived from a total of 11.5 grams of liver, including folic-acid fractions (L. casei factor [Bc] etc.) biotin, inositol, and other nutritional factors present in the liver fractions. Each capsule contains:

Thiamine HCl (B ₁)	2.0 mg.
Riboflavin (B ₂)	2.0 mg.
Niacinamide	10.0 mg.
Pyridoxine HCl (B ₆)	0.1 mg.
Calcium Pantothenate	3.0 mg.
Choline	10.0 mg.
Inositol	5.0 mg.
Folic-acid fractions	10.0 mcg.

Hypervitam is supplied in bottles of 30, 60, 90, 500, and 1000 capsules. Lipo-Heplex is issued in bottles of 100, 250, 500, and 1000 capsules. Detailed literature is available from the U. S. Vitamin Corporation, 250 East 43d St., New York 17, N. Y.

THE DETAILMAN AT WAR

It would make an interesting story if one could collect the war history of the many detailmen who have entered the armed services. We know that the full quota of the representatives of drug manufacturers have done their share as soldiers and sailors, many of them holding responsible positions in the medical services, in hospitals, and as hospital pharmacists. Many went directly into the Army purchasing offices, where their knowledge of pharmaceuticals and specialties was of great value in the various phases of the medical procurement services. These men have done their job well. It is an exciting and interesting moment when the detailman returns to civilian life and is again ready to take his bag and renew his professional work among the physicians and hospitals.

Like detailmen of other organizations, those from Bilhuber-Knoll Corp. have given a good account of themselves in the war. Several have already returned. These men were not replaced during the war and have their choice of territories as they return. We know they are anxious again to be in a position to call on their many doctor friends and again present the merits of Metrazol, Dilaudid, Theocalcin, and other Bilhuber-Knoll specialties.

BURROUGHS WELLCOME & CO. INTRODUCES "METHEDRINE" INJECTION

Burroughs Wellcome & Company announces the availability of "Methedrine" brand d-Desoxyephedrine Hydrochloride Injection for distribution through prescription channels. "Methedrine" is a sympathomimetic drug which exerts a marked and relatively prolonged rise in blood pressure following parenteral administration. "Methedrine" Injection is indicated during operative procedure to maintain blood pressure or restore it to normal. It is also valuable as an analeptic in the treatment of coma caused by alcoholism or overdosage of sedatives or hypnotics.

Available in one strength only: 20 mgm. in 1 cc., boxes of 6, \$1.20; 12, \$1.90; and 100 ampuls, \$2.85 (list prices).

Wyeth "Pioneers of American Medicine" Paintings Prove Popular at Pharmaceutical and Medical Meetings

Wyeth paintings, "Pioneers of American Medicine," executed by Dean Cornwell and depicting colorful scenes in the history of American medicine and pharmacy, are in popular demand from coast to coast. Here is a schedule of exhibitions the paintings have filled recently:

The Hotel Taft, New Haven, Conn., for the occasion of the celebration of the 20th anniversary of the founding of the Connecticut College of Pharmacy.

At a meeting of the College of Osteopathic Physicians and Surgeons, Los Angeles, Calif., the week of November 12, in connection with that organization's annual meeting.

At the Santa Barbara Museum of Art, Santa Barbara, Calif., November 24 to December 5, in connection with that community's next war loan drive, which ties in closely with the activities of the Army's Medical Department at Hoff General Hospital.

Meanwhile, "Osler at Old Blockley," in which Mr. Cornwell has depicted the great and benign Dr. Osler when he worked and taught at the Philadelphia General Hospital, is being used by the Wilmington Blue Cross Association in celebration of the 10th anniversary of the Blue Cross in Delaware.

"The Dawn of Abdominal Surgery" was recently used by the Red Cross at Covington, Ky., in connection with its health educational drive among school children there.

Originals of the paintings, "Pioneers of American Medicine" are available for similar exhibitions and meetings by writing to Richard Raley, Director of Public Relations, Wyeth Incorporated, 1600 Arch Street, Philadelphia, Pa.

THE VALUE OF PLAIN GELATINE IN REDUCING DIETS

When foods of high carbohydrate or fat content are cut out of a diet for reducing purposes, the tolerable proteins those foods contain are eliminated too. Not only should these "lost" proteins be replaced, but it is often advisable to augment them as well. The average person on a reducing diet should maintain a daily intake of at least 100 grams of protein. This is often difficult without a supplementary source of protein.

For such diets, a practical supplementary protein is Knox Gelatine (U.S.P.). Knox contains no sugar or flavoring—it is all protein, and it provides seven of the ten essential amino acids. But the value of Knox lies not only in the supplementary protein it provides; it also helps patients make their limited diets more interesting and varied.

Today many doctors are finding the Knox booklet, *Reducing Diets and Recipes*, a practical help. Its low-calorie recipes include liberal amounts of the protective foods and are planned to make the diet interesting and appetizing. Approximate food values are listed for each serving to help patients keep within the prescribed calorie limits. These booklets may be had free by writing to Knox Gelatine, Johnstown, N. Y.

ANY PHYSICIAN MAY EXHIBIT "WHEN BOBBY GOES TO SCHOOL" TO THE PUBLIC

Under the rules laid down by the American Academy of Pediatrics, their educational-to-the-public film, "When Bobby Goes to School," may be exhibited to the public by any licensed physician in the United States. All that is required is that he obtain the endorsement of any officer of his county medical society. Blanks for this purpose may be obtained on application to the distributor. Such endorsement is not required for showings by licensed physicians to medical groups for the purpose of familiarizing them with the message of the film in advance of public showings in the community.

"When Bobby Goes to School" is a 16 mm. sound film, free from advertising, dealing with the health appraisal of the school child, and may be borrowed without charge or obligation on application to the distributor, Mead Johnson & Company, Evansville, Indiana.

SQUIBB RELEASES VITAMIN FORMULA FOR DEFICIENCY DISEASE THERAPY

A new product, designed especially for the treatment of patients suffering from mixed vitamin deficiencies, has been released by Squibb under the name of Therapeutic Formula Vitamin Capsules. Based on a scientific realization that the therapy of mixed vitamin deficiencies can be met neither by the use of current maintenance multivitamin preparations, nor by any simple multiplication of the dosage of such preparations, Therapeutic Formula Vitamin Capsules present potencies of therapeutic magnitude of all the vitamins, lack of which has been shown to cause deficiency states commonly occurring in man.

The formula, which was developed in the light of the latest clinical findings and which harmonizes with the views of recognized leaders in the field of nutritional therapy, provides in each capsule: vitamin A, 25,000 units; vitamin D, 1000 units; thiamine hydrochloride, 5 mg.; riboflavin, 5 mg.; niacinamide, 150 mg.; ascorbic acid, 150 mg. In the average case of moderate mixed vitamin deficiency, one capsule daily provides the minimum therapeutic dose; in severe cases, two capsules. Therapeutic Formula Vitamin Capsules are available in bottles of 100.



